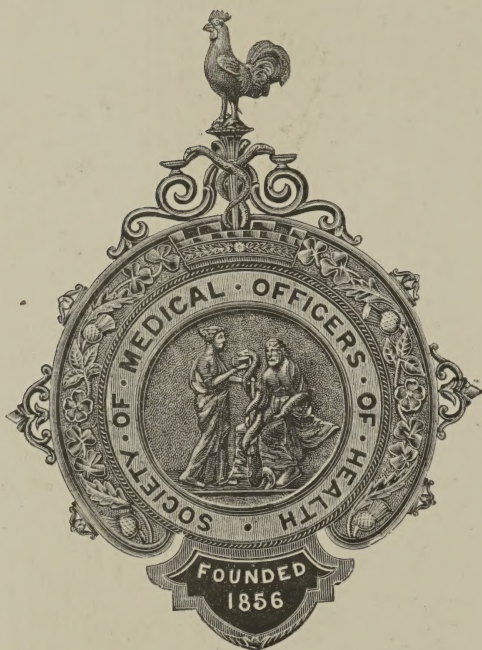




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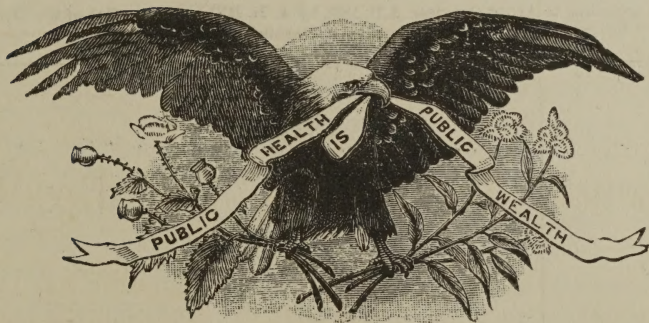


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# THE SANITARIAN,

A MONTHLY MAGAZINE

DEVOTED TO THE  
PRESERVATION OF HEALTH, MENTAL  
AND PHYSICAL CULTURE.



VOLUME XIX. JULY TO DECEMBER.

A. N. BELL, A.M., M.D., Editor.

T. P. CORBALLY, A.M., M.D., } Associate Editors.  
HARRY KENT BELL, M.D., }

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# THE SANITARIAN.

JULY, 1887.

NUMBER 212.

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## THE FINANCIAL VALUE OF SANITARY SCIENCE.\*

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By EDWIN CHADWICK, C. B., London.

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AS complementary to the recent Parliamentary Budget, I would beg to submit for ourselves, and by way of example for the "Health of Nations—" of which Dr. B. W. Richardson is about to treat at length very shortly—the financial value of properly qualified sanitary service. And, first, let me refer to the amounts of money charges upon the community arising from the excessive sickness and mortality which we have proved to be preventible by sound sanitation. Some approach may be made to estimate the amount of those charges from the ascertained incomes of the life insurance companies, which perhaps do not comprise more than two thirds of the population. There are some ninety-three of these companies, comprising almost exclusively middle-class persons, of which companies the annual income is stated to be twenty-three millions; and there are also the great friendly societies, of all sorts, whose aggregate annual insurance charges—as stated upon the authority of Sir James Paget—is twenty-five millions annually, or three times the amount of the Poor's Rates. The two yield a total of forty-eight millions annually. And if we could ascertain the full number of the uninsured, I expect that the whole would double the total budget for both the army and the navy, which is stated to be thirty-two millions. Thus,

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\* Presidential Address at the annual meeting of the Association of Public Sanitary Inspectors.

from the neglect of the sanitary service, and the continued bad condition of the defences, we have an annual invasion of an enemy in the form of preventible disease, which every year fights and wins a battle against the community, and every year slays in the United Kingdom upward of one hundred thousand of the people beyond the present reduced death-rate—all of whom we know and have proved might have been saved by more efficient sanitation, and at a saving of double the annual cost of the naval and military defences, of the loss for the killed and the wounded. That is to say, for one hundred thousand deaths of the wage classes, for every death of an adult there is found to be twenty cases of painful sickness and of disablement and loss of work. The total estimated pecuniary loss from the killed and wounded in civil life may be estimated as equalling, by two thirds, the estimates voted by Parliament for the Governmental expenditure of the Empire. Even in this metropolis, the lowest death-rated place of any metropolis of the chief States of Europe, or of New York, or of any great city in the United States, we have shown by what has been done, by partial applications of sanitary defences, there are upward of twenty thousand killed and wounded annually whom efficient sanitary defences might have saved. All this excessive loss of life, as well as of money, when examined, will be found to be due to the wastefulness of ignorance in legislation and in administration. The only effective preventive will be found to be in the superior economy of tested and corrected sanitary science. In the metropolis the executive functions are generally confided to persons very inadequately furnished with the qualifications required, and incapable of giving proper instructions for the protection of the public. In their ill-informed, or uninformed, condition these local bodies, the vestries, are generally positively unaware of the need of the undivided attention required for sanitary service, and they give such low salaries as often to leave the chief local health officers under the necessity of making up their income by private practice—that is to say, curative practice—the difference between curative practice and preventive practice in the new science of sanitation not being perceived by them. Salaries of fifty or a hundred a year or little more are allowed for health officers, while the



very least required to be given for the undivided attention demanded would be at least such salaries, with arrangements for promotion and retirements, as are given to the army and navy medical officers, and, indeed, higher salaries, for it is to be noted that the curative service keeps hospitals full; and that it is only by the preventive service that hospitals are, or have been, emptied, as they have been in the army, by one half or more. I read the reports of local health officers, especially of those in the provinces, often; but I must say that it is rare to meet with one displaying all the qualifications of a competent mastery of the principles of the preventive service. Too often they are poor, lame, and unimpressive makeshifts. The qualifications of the executive hand of the local devising head, or health officer—I mean the sanitary inspector—would justify much increase of pay, with a view to economy of result. In one suburban district I was at pains to get out the cost to the people of preventible disease. It was upward of £40,000 per annum. Now, the pay of a mechanic is 9*d.* per hour, or 6*s.* 9*d.* *per diem* of nine hours of daily work, and that local vestral authority actually proposed to give the sanitary inspector a salary of £20 a year, or payment at the rate of 1*s.* 4*d.* a day. But a penny in the pound of the reductions to be effected would about pay the proper salary of an officer with the qualities properly needed to effect the large practicable reduction of the annual charges of the sickness and death-rates.

A revision and consolidation of the preventive functions, now scattered over different and weak departments, and systematized under one department, and under unity with an executive board, under the supervision of a Minister of Health, will be found, on examination, to be necessary for the pecuniary relief of the population, from the greatest and most grievous of its burdens, as well as for the advancement of its health and strength and the happiness of its existence.

The fact I believe to be unknown—although it is a large fact to go unnoticed—that by the services of some twenty thousand paid union officers, including five thousand officers exercising sanitary functions, some three millions per annum, or one third, is saved over the previous rates of expenditure of so-called unpaid parish overseers. My confidence, from

various experiences which are now in progress, is that by recourse to the first principles of the measure propounded in 1832, which has been petitioned for by the representatives of guardians and the Chambers of Agriculture, for restricting the unskilled and irresponsible services of the unpaid guardians to supervisory functions as originally provided, and by confining the executive functions to better paid, better qualified, and responsible paid officers, a further reduction of the rates, by two or three millions, may be effected, with an improved and more humane administration. The metropolitan and the county police forces exercise important sanitary functions, in the inspection and regulation of the common lodging-houses, the former seats of the worst, but now expelled, epidemics, and they have given to the inmates better protection of life than is possessed by large proportions of the wage classes living under the vestral administration. The sanitary protection of the police now given to nightly lodgers should, I submit, be extended to weekly lodgers, whose residences are almost as changeable as the nightly lodgers. The police are otherwise properly allies of the sanitary service, in seeing to the due execution of orders for the proper cleansing of roads, and of other work of a sanitary character, besides the protection of life and property from fire, which they exercise in Manchester, Liverpool and Glasgow, by applying water from the hydrants at street water-mains in one third of the time that is now occupied in London for bringing large distant engines to bear, and at a reduction of two thirds of the insurance charges to which the rate-payers of the metropolis are subjected by vestral administration.

In respect to two of the county forces, it was proved in detail that their cost was not greater than the cost of the unpaid parish constables. I believe it may be shown that the public have the additional services of the paid forces, generally, gratis over the former unpaid parish constables. We could not easily get at the cost of the old nightly parish watch in the metropolis, but I have a confident anticipation that, results considered, the cost of the police of the present metropolis does not exceed it. That cost is now about one penny a week per head of the population. In public education, too, increased payment for increased qualifications will be the means of largely increased economy in results.

If the principles which were laid down in our first report of 1839 for the organization of a police force be fully carried out, as I believe they eventually must be, and the partial payments of the provincial forces be cleared off, for the sake of efficiency under unity, I have no doubt that considerable economies would result in the public service, especially in the military service in Ireland. In the United States the principles of our metropolitan organization have been adopted, and, as the Mayor of Brooklyn lately informed me, they have made the advance of the adoption of the principle of our competitive examinations the tests for their appointments.

It is due to state that, with all the shortcomings of defective local administration, the advances made in sanitary improvement during the reign of Her Majesty have been greater than in any country in any of the great States. In France they have only got a centralization against the people chiefly for military levies, and they are now only making slow progress with centralization for the people in their places of work, for the protection of the people in their habitations, and for their protection against tyranny in the productive freedom of service. In France the death-rate is three in a thousand more than in England, which means that there is a preventible slaughter there of one hundred and twelve thousand lives more than there is now in England. In Germany the mortality of the army is the lowest in Europe, and there is much to say in the way of example of the economies wrought by it, but, under its municipal government, the death-rate of the civil population in Germany is very high. It is six in a thousand higher than in England, which means a sacrifice of one hundred and thirty-five thousand more lives than is now annually sacrificed in this country. In Italy the death-rate is eight in a thousand higher, which implies a sacrifice of two hundred and twenty-four thousand lives to the wastefulness of ignorance there. In Austria the devastation is still greater even than that. It is no less than eleven in a thousand above our death-rate, which occasions a loss in that empire of upward of four hundred thousand more than the present rate in England and Wales!

But the death-rate of the army in Russia is three times greater than of the army in Germany, and the death-rate of the civil population, as described by the Registrar-General of



France, is still more terrible. To an international arbitration a decisive case could be made out against the extension of such bad government over any population. These are examples of the wastefulness of ignorance and sloth against the economies of well-applied sanitary science.

From the estimate of Professor Corfield, it appears that the duration of life to the whole population has been advanced by eight years in England and Wales during Her Majesty's reign.

These statistics denote what we know to be the fact of the comparative stagnation of sanitation as regards the wage-classes in the several States above named. In the United Kingdom the mean duration of life has been advanced during the reign of Her Majesty from thirty to thirty-eight years, leaving a further equivalent advance dependent on the advance of a more economical sanitary organization of paid service.

In all the European States it will be found that the Governmental and legislative functions are weaker than with us, and the productive power of the population is also lower than with us. But with us the weakest and most wasteful service is that which is distracted, ill-informed, and irresponsible. Perfect sanitary science constantly and responsibly applied by permanent officers giving their undivided attention to its application is in the highest degree the most economical in result.

Gentlemen, I fear you will consider my facts high and dry. I cannot help it if they are, for you must know that it is impossible to translate figures into poems. Nevertheless, the facts are useful to you as you progress, and hard as they may be, I would have you commit them to memory. They will form a good basis for you to build upon long after I shall cease to be. They may suggest to you the grandeur, the importance, and, if I may so say, the solemnity of your work. When you are doing what some would call even menial service; when you are taking part in the removal of the most offensive causes of disease and death, you are conveying a practical lesson to the world of the methods whereby the happiness, the brightness, the comfort, and the strength of the world is secured. You are giving health to man, and out of this some poet may even extract poetry in a future day. Meantime, accept it as true from one who has seen eighty-six summers that yours is as good a work as the sun ever shone upon, and that long be-

fore another eighty-six summers shall have passed away, it will be recognized as work which deserves the fullest recognitions and the most befitting rewards if it be carried out—as I am sure it will be—in the spirit as in the letter, faithfully, vigorously, hopefully, manfully.

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## THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

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By Dr. HORATIO R. STORER, Newport, R. I., Member American Public Health Association, American Medical Association, Massachusetts and Rhode Island Medical Societies; Honorary Member Canadian Medical Association, New Brunswick (Canada) Medical Society, Medical Society of Finland, etc.; Corresponding Member New York Medico-Legal Society; Member Newport Historical Society and late Curator of its Coins and Medals; Corresponding Member American Numismatic and Archæological Society.

*(Continued from page 450, Vol. xviii.)*

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### D. FRANCE.

Dr. Jean Baptiste Louis Chomel, of Paris (1700–65. The first of these dates is not given by the Index Catalogue of Library, United States Surgeon-General's Office). “An hygiene medicinæ pars utilissima, desertissima?” (1743.)

62. Obverse. Bust to left, with flowing wig and academic robe. Upon a fold of the drapery, 1756. Exergue: J.D(u). V(ivier). Inscription: J.B.L.Chomel Paris.—F(acultatis). M(edicalis). P(arisiensis). Decanus. Reverse. Arms of the Faculty; three storks to left, bearing sprigs of marjoram (incorrectly called laurel by Kluyskens; the technical term is *origanum*). Above, a blazing sun, with clouds. Legend: Urbi et Orbi Salus. Exergue: Facult.Medic.Paris. | 1754. 1755. | 1756. Edges milled, with fine inner circle. Bronze. Silvered copper. 18.

Neumann omits the date upon obverse, which would be quite sure to be wanting upon a worn specimen, and gives upon the reverse a wholly erroneous device. Duisburg has a dot after Orbi, and omits Salus.

Kluyskens, i., p. 200.

Duisburg, p. 87, CCXLVII.

Neumann, No. 31,215.

I have this jeton in my cabinet. It was unknown to Rudolphi and to Moehsen ("Beschreibung, etc., aus Gedächtniss-Münzen berühmter Aerzte," 1773). To the excessive rarity of the whole series of the jetons of the Deans of the University of Paris I referred in my paper upon the medals illustrative of obstetrics and gynæcology, and stated that, having come into possession of the very perfect collection made by the late Dr. Achille Chereau, of Paris, I hoped at some future day to publish a critical study of them. Owing, probably, to their rarity, the descriptions given have been most confusing and imperfect, authors seeming to have taken their accounts merely from each other, without opportunity of verifying the record, and but a portion of the jetons appear to have been described at all. Rüppell, of Frankfort-on-the-Main, the latest of the writers on personal medical medals (1875-76), speaks of having jetons of no less than thirty-eight deans; my own series, in originals and casts, reaches nearly to seventy.

Dr. Jean Pierre Joseph D'Arcet, of Paris (1771-1844, Duisburg; the first of these dates is stated as 1777 by the Index Catalogue of United States Surgeon-General's Office, and by Thomas's Biographical Dictionary). "Collection de mémoires relatifs à l'assainissement des ateliers, des édifices publiées, etc." Paris, 1843, 4°.

63. Obverse. Two busts. Beneath, Gayrard F. Inscription: Jean D'Arcet. J.P. Joseph D'Arcet. Reverse. An oak wreath, within which in fifteen lines, J.D'Arcet — — Mort 1801. J.P.J.D'Arcet — — Mort 1844. Bronze.

Duisburg, p. 60, CLIII.

Unknown to Kluyskens.

Dr. Michel de la Vigne, of Paris (1588-1648). Physician to Louis XIII., whose autopsy he made. "Dioeta sanorum, sive ars sanitatis" (Paris).

64. Obverse. The family coat-of-arms; within laurel branches, united by ribbon both above and below, a shield divided by a square into two compartments, in the upper of which are two stars, to right and left, and in lower a bunch of grapes. Legend, at both sides and above the shield: Cœli. et. Pacis. Amore. Reverse. The Arms of the Faculty; three



storks with twigs of marjoram, and a radiant sun. Legend : Vrbi.et.Orbi.Salvs. Exergue : Facvl.Medic. | Paris.1643. Edges milled. 18. 30 mill.

Neither Kluyskens nor Duisburg have the dots in legends of obverse or reverse, but they had probably neither of them seen the jeton.

Kluyskens, i., p. 240.

Duisburg, p. 75, CXCIX.

This was unknown to Moehsen, Rudolphi, and Neumann. Its rarity may be judged by the fact that the late Dr. Chereau, of Paris, had but casts of it, which are now in my possession. Kluyskens describes as upon the obverse the following inscription, which Duisburg blindly copies : " M.Michaeli.de.la.Vigne.Decano. Exergue : 1644." It is my impression that such does not exist. It is not upon the specimen of Dr. Chereau ; this gentleman seems to have had access to the dies of all these jetons possessed by the French Government and now destroyed by the Commune, and he has left no notes that any variety existed distinct from that which I now have. There is, besides, no room for any inscription whatever in addition to the De la Vigne crest and the legend. Should, however, it prove that Kluyskens's type exists, then the one that I have myself described has never before been published.

Dr. Jean Charles Desessartz, of Paris (1729-1811). He wrote upon the Physical Education of Children.

65. Obverse. Bust to left, in flowing wig and robe. Beneath, B.Dvviv(ier). Inscription : Joan.Car.Desessartz Ling-(onus).Fac.Med.P.Dec. Reverse. Sectio | Symphys.Oss. Pub. | Lucina Nova | = | 1768 | Invenit, Proposuit | 1777 | Fecit Feliciter | J.R.Sigault D.M.P. | Juvit | Alph. Le Roi | D.M.P. Edges milled. Silvered and gilt copper. 18. 30 mill.

Kluyskens has Leroi, and Duisburg and Neumann Leroy. Rudolphi omits the dot after Joan. Neumann's description is so erroneous as to prove that if he had ever seen the jeton at all, it must have been a very defaced specimen. He has Gab. for Car., and Iinc for Ling. upon obverse ; upon reverse he omits both dots and the first initial of Sigault's name.

Rudolphi, p. 41, No. 160.

Wellenheim, "Verzeichniss der Münz- und Med.-Sammlung," ii., 2, p. 657, No. 13,550.

Kluyskens, i., p. 251.

Duisburg, p. 89, CCLIV., no. 1.

Neumann, No. 31,217.

This jeton is another from the series of the Deans of the Parisian University. It is in my collection, and I mentioned it in my paper upon the medals of obstetrics and gynæcology. Moehsen was unaware of its existence. Rudolphi knew it only by the obverse, and considered that it had but one face, the specimen which had been given him by Blumenbach having perhaps lost its reverse by attrition or corrosion. He speaks of it as "rarest of the rare." Kluyskens, indeed, says that there is not a copy in the National Library at Paris. This author speaks of Rudolphi's imperfect uniface as a distinct and authentic variety, which is doubtless incorrect.

66. Obverse as the last. Reverse. The family coat-of-arms: a crowned shield, with scrolls at sides. In upper field two stars, in lower a crescent. Exergue: 1776-1777. Edges milled. A fine line within that of reverse. 18. 30 mill.

Kluyskens, i., p. 251.

Wellenheim, ii., 2, No. 13,551.

Duisburg, p. 89, CCLIV., no. 2.

I have this jeton also. It was unknown to Moehsen, Rudolphi, and Neumann, and had apparently not been seen by Duisburg.

Baron Dr. René Nicolas Dufriche Desgenettes, of Paris (1762-1837). Professor of Hygiene and Member of the Royal Central Sanitary Commission. "Gymnastique médicale." Paris, 1828, 8°.

67. Obverse. Bust, designed by Posch. No reverse. 83 mill.

Rudolphi, p. 41, No. 161.

Kluyskens, i., p. 252.

Duisburg, p. 68, CLXXIV.

Desgenettes will be again hereafter mentioned under Sections X., Plague and Yellow Fever, and XI., Military and Naval Hygiene.

Dr. Jean Baptiste (A.) Dumas, of Paris (1800-84). The originator of European Sanitary Congresses.

68. Obverse. Head to left. Beneath, Barre 1875. Reverse. Professeur | J.B.A.Dumas | Secrétaire Perpetuel | de l'Académie des Sciences | Grand-Croix | de la Legion d'Honneur | Vice-President | du Conseil Superieur | de l'Instruction Publique | Ancien Ministre | de l'Agriculture | et du Commerce | Ancien Président | de la Commission | des Monnaies. Edges beaded. Bronze. 27 lines.

Rüppell. Medaillen auf Aerzte und Naturforscher (1876), p. 5.

In 1869 Dumas also received the Faraday medal from the London Society of Chemistry. I have not as yet met with its description. It was unknown to Kluyskens, Duisburg, and Rüppell.

Dr. Laurent Joubert, of Montpellier (1529-83). "Erreurs populaires etc. touchant etc. le régime de Santé." Bordeaux, 1579, 8°.

69. Obverse. Bust. Behind it, the astrological sign of Jupiter. Inscription: M.Lavr.Jovbert Val.Delph.Monsp. Medicvs.An.1558.æt.28. No reverse. Tin, cast. From MS. notes in my possession, by Professor Benoni Friedländer, of Berlin; it exists also in bronze. 63 mill.

Neither Rudolphi nor Kluyskens have M. Duisburg adds the figure 9 (symbolizing, etc.) to Jovbert.

Hanschid, Beitrag zur neuern Münz- und Med.-Geschichte, No. 413.

Rudolphi, p. 83, No. 345.

Kluyskens, ii., p. 71.

Duisburg, p. 42, CXVII.

Dr. Joubert will be hereafter again cited under Section X., Epidemics.

Dr. Mathieu Joseph Bonaventura Orfila, of Paris (1787-1853). "Traité de médecine légale." Paris, 1821.

70. Obverse. Bust to right. In front, incised, Orfila. Below, incised, David 1826. No reverse.

Duisburg has dot before date, and Rudolphi erroneously gives the date as 1726. Bronze. Oval. 80 x 97 mill.

Rudolphi, p. 175, No. 491 b.

Kluyskens, ii., p. 269.

Duisburg, p. 72, CLXXXVII., no. 1.



71. Obverse as preceding. Upon reverse, Eck et Durand. No reverse. Bronze. 84 mill.

Kluyskens, ii., p. 269.

Unknown to Rudolphi and Duisburg.

72. Obverse. Bust to left. Beneath, E. Farochon F. Inscription: M. J. B. Orfila Président Fondateur et Bienfaiteur. Reverse. In field: "Je mets au Premier rang des choses utiles qu'il m'a été donné de faire, la Fondation de l'Association. . . ." Perigraph: Association des Médecins de la Seine, Fondée en 1833 Décrétée d'Utilité Publique en 1851. Below, a star.

Upon rim of the Lee specimen, Cuivre.

Duisburg does not give the quotation marks, nor the comma after Faire. Bronze. Gilt bronze. 30 mill.

Kluyskens, ii., p. 269.

Duisburg, p. 72, CLXXXVII., no. 2.

This is in the Lee Collection.

Dr. Antoine Augustin Parmentier, of Paris (1737-1813). President of Council of Health. Did much for improvement of food, and introduced cultivation of potato.

73. Obverse. Bust to right. Beneath, E. Dubois F. Inscription: Ant<sup>ne</sup> Aug<sup>ln</sup> Parmentier. Reverse. Ceres, near whom a potato plant surrounded by tubers and a ploughshare, points them out to a female, upon whose knees an infant. Below, Caunois F. Upon rim, Cuivre. Bronze. 50 mill.

Kluyskens, ii., p. 299.

Duisburg, p. 63, CLVIII.

This was unknown to Rudolphi.

Parmentier will be again referred to under Sections IV., Mineral Springs; VI., Sewerage; VIII., Diet; X., Vaccination; and XI., Military and Naval Hygiene.

Dr. François Vincent Raspail (1794-1878). "Natural History of Health," 3 vols., 1846.

Quite a number of strictly political medals were struck of Raspail in 1848, several of which are given by Kluyskens and Duisburg, others by Neumann, and others still by De Saulcy (Souvenirs num. de la rév. de 1848), who also figures them. One of Neumann's (No. 30,257) is sufficiently interesting to

reproduce here, since it makes reference, though not very respectfully, to Raspail's professional avocation. It is very rare.

74. Obverse. Ignorance—Misère—Crédulité. | Glorieuses | Elections du 18. 7<sup>bre</sup> | 1848. | —. — | Honneur a la Ville | de Paris. Reverse. Ch. Louis Napoléon Buonaparte | dit | Napoleon III. | Sergent-de-ville Anglais ; | Ach Fould, | éleveur de juments et de lorettes, | F.V. Raspail, | débitant de camphre | et | dorviétan.

Kluyskens, ii., p. 345.

Duisburg, p. 73, CXCI., nos. 1-3.

Neumann, Nos. 30,257, 30,374, 30,375.

De Saulcy, pl. 15, No. 3 ; pl. 24, No. 5 ; pl. 26, No. 2 ; pl. 49, Nos. 8-9 ; pl. 53, No. 7 ; pl. 57, No. 2.

#### E. GERMANY.

Graf Dr. Ernst von Bibra, of Nuremberg (1806-78). Wrote upon various questions of hygiene.

75. Obverse. Bust to left. Inscription : Ernst Freiherr v. Bibra Dr. Med. et Phil. N(atus). Schwebheim 9 Juni 1806. No reverse. Bronze, cast.

Duisburg, Suppl. II., 1868, p. 13, CDLXXIII<sup>c</sup>.

Unknown to Rudolphi and Kluyskens.

Dr. Bernhard Christopher Faust (1755-1842. Last date not in Index Catalogue of United States Surgeon-General's Office), Court Physician at Lippe-Schaumburg. "The Catechism of Health." New York, 1798, 12°, and London, 1832, 8°. He taught how to preserve health, to prevent epidemics, and that houses should be exposed to the sun (see medal).

76. Obverse. Bernhardo Christophoro Faust consil. et medico suo decem abhinc lustra summis in medicina honorib. rite ornato amicus Georgius Guilelmus Princeps Schaumburgo-Lippiacus xiv. a. cal. Aug. 1827. Below, Maas fecit. Reverse. Nihil humani a se alienum putavit sanos servare dolores sauciorum lenire contagia arcere frumenta recondere et domus ad solem convertere docuit. Silver. Bronze. 40 mill.

Rudolphi has dot after A, and has Maass.

Rudolphi, p. 52, No. 210.

Kluyskens, i., p. 296.

Duisburg, p. 162, CCCCXXXIV.

Dr. Johann Peter Frank, of Vienna (1745–1821). Director-General of Public Health in Lombardy. "Creator to a certain extent of medical police and public hygiene" (Kluyskens); "the founder of scientific hygiene" (Block, *Le Dictionnaire de la Politique*). "Dissertatio medica curas infantum physico-medicas exhibens." Heidelberg, 1766, 4°. "De populorum miserâ morborum nutrice." Ticini, 1790, 8°. "System einer vollständigen medicinischen Polizey." Frankenthal, 1791–94, 12°.

77. Obverse. Two busts to left. Beneath, De Mayno cur. ex test. F. Broggi F. Inscription: Joan. Petr. Frank et Joseph. Filius. Reverse. Within a crown of oak leaves, the staff of Æsculapius. Legend: Scientia auxilium præsens Humanitate comite. Bronze. Gilt do. 32. 53 mill.

Duisburg has Brozzi, Curavit and Testamento.

Koehne, "Zeitschrift für Münz-, Siegel- und Wappenkunde," 1851, p. 86.

Kluyskens, i., p. 322.

Duisburg, p. 146, CCCXCV., no. 1.

This was struck by the will of Joseph Frank, the son, for distribution to numismatic and medical societies. It was unknown to Rudolphi. It is in the Lee Collection, and my own. Dr. Frank will again be referred to under Section X., Epizootics.

Dr. Christopher Wilhelm Hufeland, of Berlin (1762–1836). "Art de prolonger la vie." Jena, 1796. "Makrobiotik, oder die Kunst das menschliche Leben zu verlängern." Jena, 1797, 8°. "Conseils sur l'Education physique," 1799. "Histoire de la Santé," 1812.

In his *Macrobiotik*, Hufeland asserted that Europe had killed more Americans by its alcohol than by gunpowder.

78. Obverse. Bust to right, with flowing hair and a fur collar. Beneath, on shoulder, Brandt F. Inscription: Christ. Guil. — Hufeland. Reverse. A monument, upon upper shelf of which the staff of Æsculapius and a parchment bearing *Macrobi | otice*. In front, a nude angel raises and gives drink to a half nude woman who has two infants. Another nude angel extends the thread of life. Exergue: *Natvræ præcepta colens morbisque medetvr | filaqve parcarvm lentivs ire docet | — | D. xxiv. M. Jvl. A. MDCCCXXXIII.* Silver. Bronze. 26. 41 mill.



Kluyskens and Duisburg give the date of the year, and the former that of the month also, in Arabic numerals.

Kluyskens, ii., p. 43, fig.

Duisburg, p. 157, CCCCXX., no. 1.

In the Lee and Fisher Collections and my own.

79. Obverse as preceding. Reverse. Natus | Thuringorum  
| MDCCLXII XII Aug. | Obiit Berolini | M<sup>D</sup>CCCXXXVI XXV  
Aug. Bronze. 26.

Duisburg gives all the dates in Roman numerals.

Duisburg, p. 157, CCCCXX., no. 2.

Unknown to Kluyskens. It is in my collection. In the Catalogue of the Wood Collection, No. 2318, the name is wrongly spelled Huffeland. Allusion will be again made to this author under Sections IV., Mineral Springs; and XI., Military and Naval Hygiene.

Dr. Christian Friedrich Schack (1752–1824). Officer of Public Health.

80. Obverse. Bust. Beneath, Beyerhaus. No reverse. Iron-cast. 80 mill.

Rudolphi, p. 143, No. 598.

Kluyskens, ii., p. 426.

Duisburg, p. 148, CCCXCIX.

Referred to subsequently under Section XI., Military and Naval Hygiene.

#### F. SWITZERLAND.

Dr. Conrad Gessner, of Zurich (1516–65). “*Sanitatis tuendæ præcepta*,” etc. Tiguri (1556), 16°. “The newe Iewell of Health,” etc. London, 1575, 4°, black-letter.

81. Obverse. Bust. Beneath, H.I.G(essner). Inscription: Conradus Gessnerus M.D. Reverse. His coat-of-arms: four animals selected by him as the kings of their kind. Inscription, in continuation of that of obverse: Archiat.Prof. Phys.Tigvrin. Exergue: Mvnific.Avg.1564. Silver. Copper. 32 mill.

In the Catalogue of the Mead Collection (1755) there is given Tiguri, and both here and in the Index Catalogue of the United States Surgeon-General's Office the name is called Gesner.

Gaetani, "Museum Mazzuchellianum," i., p. 308, pl. 66, No. 4.

Haller, "Schweizerisches Münz- und Medaillenkabinet," No. 204.

Lengnich, "Merkwürdigkeiten einer Medaillensammlung," p. 865.

Rudolphi, p. 64, No. 267.

Kluyskens, i., p. 357.

Duisburg, p. 102, CCLXXII.

#### G. HUNGARY.

Dr. Franz Bene (1775-1858). "Elementa Politicæ Medicæ." Buda, 1807, 8°.

82. Obverse. Bust to left. Beneath, J.D.Bœhm F. Inscription: Bene Ferenez Orvostudor Szül. 1775. Megh. 1858. Reverse. Within a crown, entwined with medicinal plants, in eight lines: A Magyar Orvosok és Termesztet Vizsgálók Gyűlése Alapítójának és Nesztorónak Hála Emlekül. 1863 (The Convention of the Physicians and Naturalists of Hungary in grateful remembrance of its founder and Nestor). Bronze. Duisburg, Suppl. II., 1868, p. 15, DXX<sup>b</sup>.

#### H. ITALY.

Dr. J. Coster, of Turin (1795 [1798, Rüppell]-1868). "Dictionnaire de Santé." Paris, 1829, 8°.

83. Obverse. Bust to left. Beneath, Borrel F. Inscription: J. Coster Dr en Médecine. Reverse. Hommage Au Président De La Société Philanthropique Savoisienne Ses Compatriotes—1846.

Duisburg has a dot after Dr., and gives Philanthropique. Bronze. 40 mill.

Kluyskens, i., p. 222.

Duisburg, p. 38, CVIII.

Rüppell. "Beitrag zur Kenntniss der num. Errinn. an Aerzte und Naturforscher," 1876, p. 15. This is in my collection.

#### I. SWEDEN.

Dr. Olaus ab Acrel, of Stockholm (1717-1807). Member Royal Sanitary Commission.

84. Obverse. Bust. Inscription : O.ab Acrel Equ.Aur. Præf.Nosodoch.Suec. Exergue : G.L(jungberger). Reverse. Socio Salutaris Scient.Laudibus Præf.Claro de Patria et Civibus Optime Merito Acad. R. Scientiar. Stockholmiens. 1781. Silver. Tin. 35 mill.

Kluyskens has Equu., and Liunberger, and omits the dot after O.

Lüdecke, "Allgemeines Schwedisches Gelehrsamkeits Archiv." vii., p. 22.

Sacklén, "Sveriges Läkare-Historien," p. 876.

Rudolphi, p. 1, No. 2.

Kluyskens, i., p. 4.

Duisburg, p. 209, DLV.

Acrel will be again referred to in Section XI., Military and Naval Hygiene.

*(To be continued.)*

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A QUAKER ON GOOD MANNERS AND INDECENCY.—Recently a Quaker was travelling in a railway carriage. After a time, observing certain movements on the part of a fellow-voyager, he accosted him as follows : "Sir, thee seems well dressed, and I dare say thee considers thyself well bred and would not demean thyself to any ungentlemanlike action, would'st thee?" The person addressed promptly replied with considerable spirit, "Certainly not ; not if I know it." The Quaker continued, "And suppose thee invited me to thy house, thee would not think of offering me thy glass to drink out of after thee had drank out of it thyself, would'st thee?" The interrogated replied, "Abominable. No. Such an offer would be most insulting." The Quaker continued, "Still less would thee think of offering me thy knife and fork to eat with, after putting them into thy mouth, would'st thee?" The interrogated answered, "To do that would be an outrage on all decency, and would show such a wretch was out of the pale of civilized society." "Then," said the Quaker, "with these impressions upon thee, why should'st thee wish me to take into my mouth and nostrils the smoke from that cigar which thou art preparing to smoke, after sending the smoke out of thy own mouth?"—*League Journal.*



## PURIFICATION OF THE WATER-SUPPLIES OF CITIES.\*

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By ALBERT R. LEEDS, Ph.D.

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ACTING under instructions from the Aqueduct Boards of Newark and Jersey City, I spent the past summer in examining the water-supplies of the large cities in England and Scotland. Many of these cities have already passed through crises in the history of their water-supplies similar to those at present agitating American communities. It is of the remedies which they have adopted, and of the pressing needs of Philadelphia, Albany, Newark, Jersey City, Wilmington, Washington, and other places, that I propose to speak this evening.

Our modern manufacturing towns increase in population with such rapidity that they soon find their local sources of water-supply insufficient in quantity, and dangerous to health from pollution by sewage and factory waste. Then follows a more or less prolonged period of bitter controversy. It matters not how plain the fact of gross pollution may be ; the fact is denied. In case the chemical testimony agrees with that of the senses, and water which is dirty, foul-smelling, and bad-tasting is found by the chemist to be impure, his honesty and ability are assailed. Either his results are declared false, or it is asserted that they mean just the reverse of what he himself says. Other experts are employed, and the local water-supply, though it may contain the sewage of 10,000 or 1,000,000 people, is joyfully discovered to be extremely pure and second in purity to none in the country. But at last, after years of denial, during which the public health has severely suffered, the fact of pollution is admitted, and the community resorts to one or more of the three following remedies :

1. It abandons local for remote sources, such as springs, lakes, rivers, or areas of upland drainage.
2. It sinks artesian wells, or deep wells, or subterranean galleries.

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\* A Lecture delivered before the Franklin Institute, Thursday, December 23d, 1886.

3. It purifies the polluted local supply.

In the study of this subject there is no source of information more valuable than the blue books containing the minutes of inquiry before the Royal Commissions of 1851 and 1868 upon the supply of London. It is there stated that at first London drew its supply directly from the Thames where it flowed through the town at London Bridge. This was in 1581, and a century later (1691) the Thames was again drawn upon at Charing Cross, and this intake remained in use as late as 1829. Again, in 1723, the Chelsea Water Works were established, and in 1785 those at Lambeth. While some part of the water-supply was derived from springs in the chalk formation at Chadwell (brought in through a canal called the New River, in 1613), and another part from the river Lee (introduced by the East London Water Works Company, in 1806), yet as late as the year 1829 the metropolis was principally supplied by water taken from the Thames within the reach of the tidal flow. But in 1829 a Royal Commission, consisting of Telford, Brande, and Roget, was appointed to inquire into "the description, the quality, and the salubrity" of the water. They reported "that the Thames water, when free from extraneous substances, was in a state of considerable purity; but as it approached the metropolis it became loaded with a quantity of filth, which rendered it disgusting. It appeared, however, that a very considerable part, if not the whole, of this extraneous matter might be removed by filtration through sand, and the Commission decided that it was perfectly possible to filter the whole supply with the requisite rapidity and within reasonable limits of expense." Stimulated by this report, and alarmed, probably, at the prospect of a sweeping change of the sources of supply, the companies directed their attention to the purification of the water by filtration. It was soon found that the only appropriate material for mechanical filtration on a large scale was fine sand; but the great practical difficulty was to prevent the sand from becoming clogged, and to find an easy, practical, and cheap method for its renewal. After long experimentation, a means was discovered of getting over these difficulties. It was found that by far the greater quantity of the impurities was held in suspension by the agitation and motion of the water, and that

if it was allowed to stand for some time at perfect rest, in a reservoir, the heavier and grosser particles were deposited by simple subsidence, leaving only a small proportion of lighter and finer matters to be dealt with by filtration. It was also found that when the water was allowed to filter downward through a porous bed of sand, held up in its place by underlying layers of coarse gravel, the dirt did not penetrate into its mass, but was stopped at its upper surface, so that the whole cleaning operation necessary was to scrape this surface off to a slight thickness, and when it had become too much diminished to put on fresh sand.

In accordance with these suggestions, the first large filter, which had an area of one acre, was put into use by the Chelsea Company, in 1829.\* It worked well, so well, indeed, that it led to the well-nigh universal practice of filtration in England. Our failure to do the same in this country shows that in this respect we are behind the age.

But about the time of this first use of filters in England the disturbing ideas of modern sanitary science took their rise; that unspeakable abomination, the domestic cesspool attached to a city house, began to be abolished; drainage and sewerage works were established, and the amount of impurities carried to and fro under London Bridge was increased enormously.

This agitation kept on growing, until, in the year 1834, the engineer, Mr. Telford, recommended that the Thames should be abandoned. This was not done, but in 1851 a Royal Commission, consisting of Professors Graham, Miller, and Hofmann, recommended that while the supply should still be drawn from the Thames, the points of intake should be removed above the influence of tidal flow (*i.e.*, above Teddington Lock). They made other recommendations, which were incorporated into an Act, passed in 1852, regulating the water-supply of the metropolis. In this act the two clauses of greatest significance to us are: (1) That every storage reservoir within five miles of St. Paul's should be covered; and (2) that all water supplied for domestic use *should be effectually filtered, unless it is pumped from wells direct into covered reservoirs.*

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\* Royal Comm. Water-Supply, 1868.



A mere statement of the law, which was passed after a quarter of a century of discussion by the most eminent engineers, chemists, and law-makers of England, is a more emphatic testimony to the fundamental importance of the provisions therein contained than any argument I am able to make.

This law led to certain results throughout England, which I trust will become universal. These are :

1. The education of public opinion to such a point as to demand sources of city water-supply actually and visibly free from pollution. The wealthiest communities, like Glasgow, Manchester, and Liverpool, have deemed it a wise investment of great sums of money to obtain sources absolutely free from suspicion and reproach.

2. The construction of large, and in some cases vast, reservoirs with the object, not merely of safety, but also of allowing opportunity for the dissolved organic matters to oxidize or to be carried by subsidence along with the suspended mineral matters to the bottom.

3. Effectual filtration. And it should be noted that when the Act of 1851 required the London companies to filter the water, under very heavy penalties, the water referred to was that taken from the Thames above Teddington Lock, which water the Commission had previously found to be "perfectly wholesome, palatable, and agreeable." Still more striking instances of the estimate put upon filtration, as a process indispensable to the excellence of city water-supply, were frequently brought under my personal observation, and some I shall mention later.

4. The preservation of the water after it has been filtered in covered storage reservoirs.

The good effects of the Act of 1851 speedily became apparent. The water companies expended £2,500,000, with the result, according to the examinations of Professor Hofmann and Mr. Blyth, made in 1856, of bringing about "a very positive and considerable diminution in the amount of organic matter. This, though doubtless due chiefly to the removal of the intake to a point above the tideway of the Thames, was also attributed in great degree to the considerable improvement which had taken place in the collection, filtration, and general management of the supply of water."

But, fortunately, the public was not satisfied. In pursuance of the recommendations of the Royal Commission of 1865, on the pollution of rivers, the admission of sewage or any other offensive or injurious matter into the Thames, or into any tributary stream or water-course within three miles of its junction with the Thames, was declared illegal, with heavy penalties. In 1866 5596 lives were destroyed in London by cholera, and although this visitation was subsequently attributed to the polluted water of the Ravensbourne and the foul, unfiltered water from the reservoirs at Old Ford on the river Lee, yet it so alarmed the community that the Commission of 1866 was appointed to make a far more extended inquiry than ever before, and to ascertain what supply of unpolluted and wholesome water could be obtained, by collecting and storing water in the high grounds of England and Wales, either by the aid of natural lakes or by artificial reservoirs, at a sufficient elevation for the supply of London and the principal towns of England. Now it is a well-known fact that the recommendations of the very distinguished engineers came to naught, so far as London was concerned, though they are at present bearing fruit in connection with Manchester and Liverpool.

It is well worth our while to inquire why such was the case. Mr. Bateman's plan was to bring the waters collected from the drainage areas at the head of the river Severn in Wales (including the drainage area of the Vyrnwy) by gravitation through an aqueduct 180 miles in length, and capable of conveying 230,000,000 gallons per diem. Messrs. Hemans & Hassard proposed to bring the waters of Lakes Thirlmere, Ullswater, and Haweswater, through conduits, tunnels, and pipes equivalent in their carrying capacity to a river 30 feet wide and 10 feet deep, over a length of 270 miles. These plans, which were considered the best, were reported upon unfavorably, principally on account of the cost, the estimated expense of Mr. Bateman's scheme being £55,000,000, and that of the Cumberland Lake scheme still greater.

This report decided the future supply of the metropolis, and confined it to local sources. The supply from Lake Thirlmere has already been appropriated by the city of Manchester. The water will be brought in a tunnel nine feet square to the reservoirs at Prestwich, on one side of Manchester, a distance of ninety-five miles, and continued thence

to reservoirs on the other side of Manchester, a distance of 110 miles. Mr. Hill, the engineer of the new supply, informed me that the first 10,000,000 gallons are estimated to cost £2,000,000, inasmuch as the tunnels of full size are to be constructed at once, and connected by a forty-inch iron pipe where siphons are necessary. The second 10,000,000 gallons are estimated to cost only £400,000. The land damages to persons living around the lake and along the tunnel are £225,000.

The supply from Vyrnwy Lake has been appropriated by Liverpool. This artificial lake is to be created by a dam, which, at its top, will have a length of 1173 feet, and will rise to a height of 144 feet above the bed-rock and 84 feet above the bed of the existing river. Its length will be  $4\frac{3}{4}$  miles, its area 1165 acres, and its greatest depth of water about 84 feet. The aqueduct from the lake to the existing Prescot Reservoir, nine miles east of the Liverpool Town Hall, is sixty-eight miles. It will consist mainly of tunnels, through which the ultimate supply of 40,000,000 gallons a day may be passed without filling them, and of three lines of pipes, each having an internal diameter varying according to the fall of the sections from thirty-nine to forty-two inches. All this water from the Welsh mountains will be subjected to filtration through sand-filters, the Oswestry Reservoir and the three reservoirs for filtered water having an aggregate storage capacity of 54,549,500 gallons.

In one very important particular the Commission of 1866 was certainly in error. It thought a probable increase of population to 4,500,000 or 5,000,000 would have to be provided for, and a maximum daily supply of 200,000,000 gallons, though the time for such an extended provision would be very remote. As a matter of fact, the population supplied by the companies in May of this year was 5,274,542, and the average daily supply during the month was 160,388,316 gallons. Of this, more than half, or 82,366,466 gallons, came from the Thames, and the balance from the river Lee, and from certain chalk springs in the valleys of the Lee and Thames, and from twenty-one deep wells sunk into the chalk formation to the north and south of London. There are fifty-four *subsiding reservoirs for unfiltered water*, with an area of 465 acres and



an available capacity of 1,290,100,000 gallons, and fifty-three covered reservoirs for storage of the water after filtration, with a capacity of 160,002,000 gallons. The number of filter-beds is ninety-nine, with an area of ninety-eight acres. Of this surface, ninety-two acres were cleansed during the month of May, some of the filter-beds being cleansed once and partly gone over again during the month. The maximum permissible rate of filtration is two feet per hour and per square foot of surface, but, as a matter of fact, the actual rate in the month of May last was generally much smaller than this, some filters passing only one and one-third feet. The construction of the filters varies greatly, the top layer, however, being in all cases fine sand, in depth from two to four and one half feet.

From the published analyses it appears that the quality of the water supplied to London is usually satisfactory, though at times results are obtained adverse to that portion of it which is derived from the Thames. The population of the drainage area of the Thames is very large, and although the towns located therein are compelled to purify their sewage, yet much polluting material from them and from the floating population on the river finds its way into the river.

Leaving for the present the history of the largest experiments hitherto made in the way of purification of a polluted water-supply, I shall ask your attention more particularly to the methods by which such purification may be effected.

*Artificial Aeration.*—One of the easiest and most inexpensive methods of improving the quality of water is by means of artificial aeration. The importance of natural aeration has been recognized from time immemorial, and the effect of tumbling down natural falls and rapids, passing over artificial dams, and of agitation by winds and storms, in keeping water lively and sweet, is too well known to need more than passing mention. It is of especial interest to us that this mode of improving water was first applied to city water-supply in consequence of the extremely offensive taste and odor of the Schuylkill water in January and February, 1883. The fact that the analyses revealed the presence of a large amount of sewage in the Fairmount water did not explain its peculiar offensiveness at that season, for there have been times, before and since, when it contained even more sewage and was not so

unpalatable. But it appeared to me very noteworthy that the oxygen which ought to be present in a state of solution was largely deficient. Much of it had been used up in the oxidation of the sewage, and the river, being ice-bound from its source to Fairmount Dam, had no opportunity of taking from the atmosphere sufficient oxygen to replace that which had been lost.

Reflecting upon these facts, I thought it worth while to try the effect of submitting the disgusting samples from Fairmount Pool to artificial aeration. I found that they not only took up from the air forced through them the oxygen they lacked, but also that much of the sewage to which their offensiveness was due was destroyed. These experiments suggested to me the idea of pumping air into the lower ends of the mains at the pumping-stations. This way of introducing the air was not only the easiest and simplest, but it also afforded an opportunity of placing the mixture of air and water under a maximum pressure. Air, as is well known, consists of twenty-one parts by volume of oxygen and seventy-nine parts of nitrogen; but the oxygen is more soluble in water than the nitrogen, and therefore the greater the pressure to which a mixture of air and water is subjected, the larger is the relative amount of oxygen made to enter into solution.

The study of the subject received fresh impetus from the condition of the water-supply of Hoboken in the latter part of July, 1884. At that time the oxygen in a number of samples from the Hackensack River, whence the supply of Hoboken is derived, fell to 3.87 c. c. per litre, and the total dissolved gases to 1493 c. c. Contemporaneously, the same waters, when impounded in the reservoir, became covered with a scum several inches in thickness, consisting largely of *Oscillaria*. These quickly died, and yielded up a dark blue coloring matter (*the Phococyan of Cohn*). Finally, this great accumulation of vegetable growth passed into a state of active decomposition, attended with the formation of white foam and the liberation of large volumes of carbonic acid and other gases. The water for ten days previous had been too nauseous to drink, but the whole succession of phenomena above described took place within twenty-four hours, the vast development of algæ, their breaking up with evolution of green and blue coloring matter, and their final decomposition occurring with aston-

ishing rapidity. The entire reservoir had the appearance of an enormous dyeing vat, covered with dark green and blue dye-stuffs.

A repetition of the same disastrous sequence of events was threatened on September 14th, when the percentage of dissolved oxygen fell to four cubic centimetres, and at the same time a growth of algæ began in the reservoir. But meanwhile arrangements had been perfected in anticipation of this catastrophe, and by pumping air under pressure into the mains, the percentage of total dissolved gases was raised from 15.9 cubic centimetres to 21.2 cubic centimetres. The green scum on the reservoir disappeared, and the taste and smell of the drinking-water became satisfactory.

In November, 1884, a preliminary experiment was instituted at the Fairmount Pumping Station, an air-pump being attached to the main at that point. The aerated water was pumped into the Corinthian Basin through the forty-eight-inch main, a distance of 3000 feet. The results of this experiment were so encouraging, that the chief engineer, Colonel Ludlow, obtained air-compressors for all the pumping-stations. At only one of them, however, has the process been applied—namely, at Belmont, the other mains being too leaky to permit of its being used.

At this station the water has been charged with twenty per cent of its volume of air, and the change in composition thereby effected is strikingly illustrated in the following results, which give the composition of the water before it enters the pumping-main and as it is discharged therefrom.

	PARTS PER 100,000.	
	<i>Non-aerated.</i>	<i>Aerated.</i>
Free ammonia, . . . . .	0.017	0.004
Albuminoid ammonia, . . . . .	0.011	0.007
Oxygen required to oxidize organic substances, . . . . .	0.133	0.117
Nitrous acid, . . . . .	0.0008	none
Nitric acid, . . . . .	0.45	0.54
Total solids, . . . . .	9.00	8.70

It will be seen that the albuminoid ammonia has diminished nearly forty per cent, and, what is the most noteworthy feature of all, the nitrous acid has undergone complete oxidation,



none being present in the aerated sample. At the same time, by oxidation of the nitrogenous portions of the organic matter, the nitric acid has been increased twenty per cent ; and by oxidation of the organic constituents in general, the total solids have been diminished from nine parts per 100,000 to 8.7 parts.

The process has now been applied to the entire water-supply of Hoboken, amounting to 4,000,000 gallons per diem, for more than two years, and during this time the unpleasant taste which caused its first application has never reappeared.

Similar experience in Brooklyn has caused the process to be used in connection with the water obtained from driven wells. This driven well water has been used in the Greenwood Cemetery to feed a number of artificial lakes arranged to beautify the grounds. Last summer I was asked to examine the water in the reservoir into which the driven well water is first pumped, and to devise a means, if possible, for preventing the enormous growth of plants therein. The growth, on examination, proved to be diatomaceæ, particularly of the species *Navicula viridis*, and the green vegetable substance which by its decay rendered the water offensive was the slime secreted by these diatoms. Two facts were prominent. The one was that the diatoms could be made to grow very rapidly when exposed in open jars to sunlight ; the other, that the water of the reservoir was very deficient in dissolved oxygen. It contained only 2.32 cubic centimetres of oxygen in the litre, and the enormous amount of 4.97 cubic centimetres of carbonic acid. I advised the covering of the reservoirs to exclude sunlight. The authorities were opposed to so doing, because it destroyed the very result aimed at in providing the reservoir and ponds, which was to beautify the park. Then I advised the use of an air-compressor. This was installed, and the result is given in the following letter from the consulting engineer :

NOVEMBER 27, 1886.

DR. ALBERT R. LEEDS.

*Dear Sir :* In answer to your inquiry concerning the trouble at the Greenwood Cemetery Reservoir, I would state that the water, fresh from driven wells, when delivered into the reservoir began to develop decaying vegetation, which in a short time rendered the water offensive to taste and smell ;

that immediately on receipt of your report and recommendation, last June, I set up an ordinary compressor, and pumped air into the mains under a pressure of about eighty pounds to the square inch, allowing it to escape through the reservoir with this result. At first there was no perceptible effect, but upon increasing the amount of air supplied to the water, to the extent of about ten per cent of the free air to an equal volume of water, the trouble in the reservoir disappeared. Since that time air has been freely supplied whenever there appeared to be any recurrence of the growth of vegetation in the reservoir, and there has been no return of the offensive taste and smell.

Respectfully submitted,

CHARLES B. BRUSH,  
*Con. Eng. Greenwood Cemetery.*

*Covered Reservoirs.*—In May of this year the water from the driven wells supplying the city of Jamestown, in Western New York, was similarly affected, the reservoir containing several species of diatomaceæ, among which the *Cocconema Lanceolata* was the most abundant. Certain of the protoccaceæ, especially various species of *Scenedesmus* and certain genera of *Zygnemaceæ*, including different species of *Spirogyra*, were also present. The water in the driven wells (May 22d) had a temperature of only 48°, but that in the reservoir was over 80°, and the development of the spores in the deep-well water was correspondingly rapid. The suggestion to cover the reservoir was carried out in this case, and the aquatic plants disappeared. Similar troubles, and the development of a variety of odors, chronicled as “fishy,” “pig-pen,” “cucumber,” and the like, have been reported as affecting, at one time or another, the water-supplies of most of our towns.

There is good reason to suppose that these complaints will continue as long as water, which on standing has lost much of its dissolved oxygen and has become stagnant, is exposed to our burning suns and allowed to rise to a temperature of 70° and upward, in uncovered reservoirs. Either it should be covered, so as to exclude light, and kept cool, or, if its temperature is allowed to rise above 70°, and it is exposed to the sun, it should be charged with air and kept moving.

*Storage and Subsiding Reservoirs.*—The development of aquatic growth, and the nauseous tastes and smells arising from its decay, have probably had a discouraging influence

upon the construction of large subsiding reservoirs in our own country. In many cities, as in New York and Philadelphia, the small storage capacity has been for years the cause of most serious apprehension. The new works now in progress in connection with the Croton Aqueduct will, it is hoped, overcome this danger, so far as New York is concerned. I noted, however, with great interest, that Mr. Worthen, in the course of his examination before the commission charged with providing a more abundant supply for the metropolis, made the significant remark, in relation to the great new reservoir at Quaker Dam, which will hold 3,600,000,000 gallons, that *stagnant water would not keep*. In England this difficulty is sometimes, though rarely, encountered. I asked Mr. Wood, the City Engineer of Leeds, whether the English reservoirs are injuriously affected by vegetation. He said that trouble from this source seldom occurred, but when it did occur it was owing to the growth of the American weed. The particular kind of weed he referred to was not so common as its name would appear to indicate, and I never saw it. The great benefit due to storage and subsidence was strikingly exemplified in the case of the city above referred to. Its water-supply is taken from the drainage area of the small river Washburn, at a distance of about ten miles from the city. On this stream are located three impounding reservoirs, and their waters are carried by gravity into the Eccup Reservoir, an artificial lake a mile long and holding 1,400,000,000 gallons. This supply, without addition, is adequate for the consumption of 10,000,000 gallons per diem for nearly five months. But this safeguard is only a part of the advantage due to the large size of the reservoir; for the water is made to enter at the bottom near the great dam forming one end of this artificial lake, and fifty-two feet below the surface. It then travels the entire length of the lake, and is taken out by a bell supported on masonry piers, the lip of the bell being 15 feet below the surface and 23 feet above the bottom. During its months of passage, not only nearly perfect sedimentation of earthy particles occurs, but, by a process of natural oxidation, the peaty color is bleached out. Though such is the case, all the water is subsequently filtered, seven filter-beds being adequate, and finally stored in covered reservoirs. These reservoirs are made with inverts of masonry, upon which walls are built, capped



by arches, the latter being covered with earth and handsome lawns.

It is not improbable that the difficulties which we encounter in America, from the long-continued heat of summer, may lead to remedies appropriate to our peculiar needs. I have already alluded to the advantage derived from first bringing the percentage of oxygen to the highest possible point, in delaying or preventing that condition of oxygen-poverty, with its resultant growths, which we recognize as stagnation. During the warmer months reservoirs could be provided with such a covering as might be thrown out of use when winter came on, with the accompaniment of crushing weights of snow. I saw at Manchester, Bradford, Buxton, and many other towns in England subsiding reservoirs arranged to effect a subsidence of the sludge or coagulum, which is produced when town sewage is treated with lime. These reservoirs are built with vertical partitions, so that the water flows over the top of the first and under the bottom of the second, and over the top of the third, and so on through sometimes as many as twelve compartments. Where the town sewage does not contain dye-stuffs, as at Buxton, the water coming out of the last compartment is frequently as sparkling as spring-water. The construction of subsiding reservoirs for water-storage in a similar manner would facilitate cleansing, inasmuch as the greater part of the silt would be deposited in the first and second compartments, and a constant onward movement of the water without a disturbing current would be obtained, permitting of subsidence, while at the same time preventing stagnation.

*Filtration.*—Up to the present time no material has been found which is practically available for filtration on a large scale, except fine sand. Sponge, coke, animal and wood charcoal, porous brick, carbide of iron, spongy iron, and many other materials have been tried, but with the result as above stated. When metallic iron is used excellent results are obtained, through its chemical action as a carrier of oxygen to the organic matters, which are thereby oxidized and destroyed ; but the water even then must be subsequently filtered through sand.

Until quite recently it has been supposed that the main benefit of sand-filtration is in the removal of suspended mud

and dirt, the amount of organic impurities thereby removed being small. But since Pasteur discovered that the micro-organisms, which are supposed by some to be the specific germs of disease, may be completely arrested by filtration through a thin porous plate, a great revolution of opinion has been effected. In his report for the month of May last, Dr. Frankland states that the unfiltered Thames water yielded by the method of gelatine-peptone culture 4800 colonies of microbes per cubic centimetre of water. After passage through sand-filters at Chelsea, it yielded only fifty-nine colonies, and through those of West Middlesex only nineteen colonies. This is indeed astonishing, and the more so when the remarkably pure water in the deep chalk-wells of Kent yielded eight colonies, and the same water by the time it reached its point of supply had increased in its number of micro-organisms, until 101 colonies were obtained in the culture liquid.

At the present time American engineers regard it impracticable to introduce the English system of sand-filters, on account of the great expense of operating them. This has been variously estimated at from \$2.50 to \$5 per day for each million gallons filtered, exclusive of first cost and interest. Such being the case, I need not go into a statement of the reasons why the few which have been actually brought into use in this country have been so little successful. The conviction appears to be generally entertained that American ingenuity must discover some method by which mechanical arrangements may take the place of the cumbrous English system, and dispense with the very considerable manual labor required in cleansing. Many contrivances have been brought forward, but they are crude, or have complicated systems of pipes for reversals of the current, or are wasteful in the use of filtered water for cleansing. Recently, however, an extremely simple device has been proposed, which is yielding excellent results. As is well known, the efficient part of a filter-bed is the top layer of sand, which need not be more than two feet in thickness. At Poughkeepsie, on the Hudson River, this two feet of sand rests on four feet of gravel and stone, which are provided merely to support the sand and to afford channels for the filtered water to drain away. This gravel and stone are re-

placed in the device I have alluded to, the National Filter, by a system of double pipes, which are perforated, and the annular space between the perforated pipes filled in with fine quartz gravel. The filtered water runs out through these double pipes, while the sand is arrested. By another simple arrangement the manual labor requisite to clean the deposit of dirt from the upper surface is dispensed with. A system of perforated pipes is laid at a distance of six inches below the surface. When it is necessary to cleanse the filter a reverse current of filtered water is sent upward under pressure through these pipes, and the impurities are washed off and floated away.

*Damage by Waste.*—The statistics of water-distribution in our American cities show that from one third to one half of the water is wasted, not used. Less importance seems to be attached to dirty and unwholesome water, provided there is enough of it, than to controlling dishonest waste and expending the money thus saved in improving the quality of the supply. Until such waste is stopped by metering and fines, there will be little popular sympathy or support for movements intended either to purify and filter the water at present used, or to go ninety miles to get water, one half of which will subsequently be thrown away.—*From Journal of Franklin Institute.*

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## NEW YORK TENEMENT-HOUSE ACT OF 1887.

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SECTION 296. The Board of Police, upon the requisition of the Board of Health, shall detail to the service of the said Board of Health, for the purpose of the enforcement of the provisions of the sanitary code, and of the acts relating to tenements and lodging-houses, not exceeding forty-five suitable officers and men of experience of at least five years' service in the police force, provided that the Board of Health shall pay monthly to the Board of Police a sum equal to the pay of all officers and men so detailed. At least fifteen of the officers and men so detailed shall be employed exclusively in the enforcement of the laws relating to tenement and lodging-houses. These officers and men shall belong to the sanitary company of police, and shall report to the president of the



Board of Health. The Board of Health may report back to the Board of Police for punishment any member of said company guilty of any breach of orders or discipline, or of neglecting his duty, and thereupon the Board of Police may detail another officer or man in his place, and the discipline of the said members of the sanitary company shall be in the jurisdiction of the Board of Police, but at any time the Board of Health may object to the efficiency of any member of said sanitary company, and thereupon another officer or man may be detailed in his place. The Board of Police shall have the power, and it shall be their duty to fill all vacancies in the police force in the city caused by the detailing of said officers and men upon the requisition of the Board of Health. And the Board of Police are hereby authorized and empowered to appoint fifteen additional men to the police force subject to all the law, rules, and regulations relating to and governing the appointment of patrolmen in said city.

SEC. 533. The authority, duty, and powers of the Board of Health shall extend over the waters of the bay, up to and within the quarantine limits as established by law, but shall not be held to interfere with the powers and duties of the commissioners of quarantine or health officer of the port. It shall be the duty of the Board of Health to make an annual report to the mayor of the city of New York of all the operations of the said board for the previous year. The mayor may at any time call for a more full report, or for a report upon any portion of the work of said board whenever he may deem it to be for the public good so to do. The mayor and one commissioner from the Department of Health, the commissioner of the Department of Public Works, one delegate from the Bureau of Inspection of Buildings, and the commissioner of the Department of Street Cleaning, shall meet annually, between the fifteenth day of November and the thirtieth day of December, for the purpose of considering the subject of tenement and lodging-houses in the city, and shall make such recommendations of improvement in the laws affecting tenement and lodging-houses as they may deem to be for the good of the people of the city ; they shall cause such recommendations to be sent to the governor of the State, and to the Senate and Assembly annually on or before the fifteenth day of January ; they shall also consider the subject of the execution

of said laws and shall recommend to the Board of Health such changes in the same as they may deem to be for the good of the people of the city.

SEC. 585. Said board may establish reasonable regulations as to the publicity of its records and proceedings; and may publish such information as may, in its opinion, be useful, concerning births, deaths, marriages, sickness, and the general sanitary condition of said city, or any matter, place, or thing therein. Said board shall prepare and keep the statistics of tenements and lodging-houses, and make semi-annual reports upon the same to the Board of Health, which shall transmit such statistics to the State Board of Health.

SEC. 588. Said board may appoint and commission such number of "sanitary inspectors" as the board may deem needful, not exceeding twenty-five, and from time to time prescribe the duties and salaries of each of said inspectors, and the place of their performance (and of all other persons exercising any authority under said board, except as herein specially provided); but at least twenty of such inspectors shall be physicians of skill and of practical professional experience in said city, and the residue thereof shall be selected with reference to their practical knowledge of scientific or sanitary matters, which may especially qualify them for such inspectors.

Each of such inspectors shall, twice in each week, make a written report to said board stating what duties he has performed, and where he has performed them, and also such facts as have come to his knowledge connected with the purposes of this chapter as are by him deemed worthy the attention of said board, or as its regulations may require of him; and such and the other reports herein elsewhere mentioned shall be preserved among the records of said board.

SEC. 649. No house, building, or portion thereof, in the city of New York, shall be used, occupied, leased, or rented for a tenement or lodging-house unless the same conforms in its construction and appurtenances to the requirements of this title; and if occupied by more than one family on a floor; and if the halls do not open directly to the external air, with suitable windows, without a room or other obstruction at the end, it shall not be used, occupied, leased, or rented, unless sufficient light and ventilation is otherwise provided for in said halls.

SEC. 653. Every tenement and lodging-house or building shall be provided with as many good and sufficient water-closets, improved privy-sinks, or similar receptacles as the Board of Health shall require, but in no case shall there be less than one for every fifteen occupants in lodging-houses, and not less than one for every two families in dwelling-houses. The water-closets, sinks, and receptacles shall have proper doors, soil-pipes, and traps, all of which shall be properly ventilated to prevent the escape of deleterious gas and odors, soil-pans, cisterns, pumps, and other suitable works and fixtures, necessary to insure the efficient operation, cleansing, and flushing thereof. Every tenement and lodging-house situated upon a lot on a street or avenue in which there is a sewer, shall have a separate and proper connection with the sewer; and the water-closets, sinks, and other receptacles shall be properly connected with the sewer by proper pipes made thoroughly air-tight. Such sewer connection and all the drainage and plumbing work, water-closets, sinks, and other receptacles, in and for every tenement and lodging-house, shall be of the form, construction, arrangement, location, materials, workmanship, and description to be approved, or such as may be required by the Board of Health of the Health Department of the city of New York. Every owner, lessee and occupant shall take adequate measures to prevent improper substances from entering such water-closets, or sinks, or their connections, and to secure the prompt removal of any improper substances that may enter them, so that no accumulation shall take place, and so as to prevent any exhalations therefrom, offensive, dangerous, and prejudicial to life or health, and so as to prevent the same from being or becoming obstructed. Every person who shall place filth, urine, or fæcal matter in any place in a tenement-house other than that provided for the same, and every person who shall keep filth, urine, or fæcal matter in his apartment or upon his premises such length of time as to create a nuisance, shall be guilty of a misdemeanor; no privy-vault or cesssool shall be allowed in or under or connected with any such house except when it is unavoidable, and a permit therefor shall have been granted by the Board of Health, and in such case it shall be constructed in such situation and in such manner as the Board of Health



may direct. It shall in all cases be water-tight and arched or securely covered over, and no offensive smell or gases shall be allowed to escape therefrom, or from any closet, sink, or privy. In all cases where a sewer exists in the street or avenue upon which the house or building stands, the yard or area shall be connected with the sewer, that all water from the roof or otherwise, and all liquid filth shall pass freely into the sewer. Where there is no sewer in the street or avenue, or adjacent thereto, to which connection can be made, the yard and area shall be so graded that all water from the roof or otherwise, and all filth shall flow freely therefrom into the street gutter, by a passage beneath the sidewalk, which passage shall be covered by a permanent cover, but so arranged as to permit access to remove obstructions or impurities. It shall be the duty of the Board of Health to enforce the provisions of this section in regard to privy-vaults as soon as practicable, but said board shall permit no privy-vault to remain connected with a tenement-house later than January first, eighteen hundred and eighty-seven,\* except in the cases especially named in this section.

SEC. 657. Every tenement or lodging-house, and every part thereof, shall be kept clean and free from any accumulations of dirt, filth, garbage, or other matter in or on the same, or in the yard, court, passage, area, or alley connected with it or belonging to the same. The owner or keeper of any lodging-house, and the owner or lessee of any tenement-house or part thereof, shall thoroughly cleanse all the rooms, passages, stairs, floors, windows, doors, walls, ceilings, privies, cesspools, and drains of the house or part of the house of which he is the owner or lessee, to the satisfaction of the Board of Health, so often as he shall be required by or in accordance with any regulation or ordinance of said board, and shall well and sufficiently, to the satisfaction of the said board, whitewash the walls and ceilings thereof twice at least in every year, in the months of April and October, unless the said board shall otherwise direct. Every owner of a tenement or lodging-house, and every person having control of a tenement or lodging-house, shall file in the Department of Health a notice con-

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\* So in the original.

taining his name and address, and also a description of the property by street number, or otherwise, as the case may be, in such manner as will enable the Board of Health easily to find the same; and also the number of apartments in each house, the number of rooms in each apartment, the number of families occupying each apartment, and the trades or occupations carried on therein. Every person claiming to have an interest in any tenement or lodging-house may file his name and address in the Department of Health. All notices and orders of the Board of Health required by law to be served in relation to a tenement or lodging-house shall be served by posting, in some conspicuous place in the house, a copy of the notice or order, five days before the time for doing the thing in relation to which said notice or order was issued. The posting of a copy of an order or notice, in accordance with this section, shall be sufficient service upon the owner of the property affected. It shall be the duty of the Board of Health to cause a copy of every such notice or order to be mailed, on the same day that it is posted in the house, addressed to the name and address of each person who has filed with the Department of Health the notice provided for in this section.

SEC. 658. It shall be the duty of the Board of Health to cause a careful inspection to be made of every tenement and lodging-house at least twice in each year. And whenever the Board of Health has made any order concerning a tenement or lodging-house, it shall cause a reinspection to be made of the same within six days after it has been informed that the order has been obeyed. The keeper of any lodging-house, and the owner, agent of the owner, lessee and occupant of any tenement-house, and every other person having the care and management thereof, shall at all times, when required by any officer of the Board of Health, or by any officer upon whom any duty is conferred by this title, give him free access to such house and to every part thereof. The owner or keeper of any lodging-house, and the owner, agent of the owner, and the lessee of any tenement-house, or part thereof, shall, whenever any person in such house is sick of fever, or of any infectious, pestilential \* or contagious disease, and such sickness is known to such owner, keeper, agent or lessee, give immediate notice

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\* So in the original.

thereof to the Board of Health, or to some officer of the same, and thereupon said board shall cause the same to be inspected, and may, if found necessary, cause the same to be immediately cleansed or disinfected at the expense of the owner, in such manner as they may deem necessary and effectual; and they may also cause the blankets, bedding, and bed-clothes used by any such sick person to be thoroughly cleansed, scoured and fumigated, or in extreme cases to be destroyed.

SEC. 659. Whenever it shall be certified to the Board of Health of the Health Department of the city of New York by the sanitary superintendent, that any building or part thereof in the city of New York is infected with contagious disease, or by reason of want of repair has become dangerous to life, or is unfit for human habitation because of defects in drainage, plumbing, ventilation, or the construction of the same, or because of the existence of a nuisance on the premises, and which is likely to cause sickness among its occupants, the said Board of Health may issue an order requiring all persons therein to vacate such building or part thereof for the reasons to be stated therein as aforesaid. Said board shall cause said order to be affixed conspicuously in the building or part thereof, and to be personally served on the owner, lessee, agent, occupant, or any person having the charge or care thereof; if the owner, lessee or agent cannot be found in the city of New York, or do not reside therein, or evade or resist service, then said order may be served by depositing a copy thereof in the post-office in the city of New York, properly inclosed and addressed to such owner, lessee or agent at his last known place of business or residence, and prepaying the postage thereon; such building or part thereof shall within ten days after said order shall have been posted and mailed as aforesaid, or within such shorter time not less than twenty-four hours, as in said order may be specified, be vacated, but said board whenever it shall become satisfied that the danger from said building or part thereof has ceased to exist, or that said building has been repaired so as to be habitable, may revoke said order.

SEC. 661. It shall not be lawful hereafter to erect for, or convert to the purposes of, a tenement or lodging-house, a building on any lot where there is another building on the same lot, or to build, or to erect any building on any lot



whereon there is already a tenement or lodging-house, unless there is a clear open space exclusively belonging thereto, and extending upward from the ground of at least ten feet between said buildings if they are one story high above the level of the ground ; if they are two stories high, the distance between them shall not be less than fifteen ; if they are three stories high, the distance between them shall not be less than twenty feet ; and if they are more than three stories high, the distance between them shall not be less than twenty-five feet ; but when thorough ventilation of such open spaces can be otherwise secured, such distances may be lessened or modified in special cases by a permit from the Board of Health. At the rear of every building hereafter erected for or converted to the purposes of a tenement or lodging-house on any lot, there shall be or remain a clear open space of not less than ten feet between it and the rear line of the lot. No one continuous building shall be built for or converted to the purposes of a tenement or lodging-house in the city of New York, upon an ordinary city lot, and no existing tenement or lodging-house shall be enlarged or altered, or its lot be diminished so that it shall occupy more than sixty-five per centum of the said lot, and in the same proportion if the lot be greater or less in size than twenty-five feet by one hundred feet ; but this provision shall not apply to corner lots, and may be modified in other special cases by a permit from the Board of Health. In case of any violation of the provisions of this section, or of any failure to comply with, or of any violation of the terms and conditions of the plan for such tenement or lodging-house approved by the said Board of Health, or of the conditions of the permit granted by the Board of Health for such house, or for the air, light, and ventilation of the same, any court of record, or any judge or justice thereof shall have power at any time after service of notice of violation, or of non-compliance upon the owner, builder or other person superintending the building, or converting of any such house, upon proof by affidavit of any violation or non-compliance as aforesaid, or that a plan for light and ventilation of such house has not been approved by the Board of Health to restrain by injunction order, in an action by the Health Department, the further progress of any violation as aforesaid ; no undertaking shall be required as a condition of granting an injunction, or by reason thereof.

SEC. 663. Every such house erected after May fourteenth, eighteen hundred and sixty-seven, or converted, shall have adequate chimneys running through every floor, with an open fire-place or grate, or place for a stove, properly connected with one of said chimneys for every family set of apartments. It shall have proper conveniences and receptacles for ashes and rubbish. It shall have Croton or other water furnished in sufficient quantity at one or more places on each floor, occupied or intended to be occupied by one or more families; and all tenement-houses shall be provided with a like supply of water by the owners thereof whenever they shall be directed so to do by the Board of Health. But a failure in the general supply of water by the city authorities shall not be construed to be a failure on the part of such owner provided that proper and suitable appliances to receive and distribute such water are placed in said house. Provided that the Board of Health shall see to it that all tenement-houses are so supplied before January first, eighteen hundred and eighty-nine. Every tenement-house shall have the floor of the cellar made watertight; and the ceiling plastered, and when the house is located over filled-in ground, or over marshy ground, or ground on which water lies, the cellar floor shall be covered so as to effectually prevent evaporation or dampness. It shall be the duty of the Board of Health\* that the cellars of all tenement-houses are so made or altered as to comply with this section before January first, eighteen hundred and ninety. Every such house erected after May seventh, eighteen hundred and eighty-seven, or converted shall have the halls on each floor open directly to the external air, with suitable windows, and shall have no room or other obstruction at the end, unless sufficient light or ventilation is otherwise provided for in said halls in a manner approved by the Board of Health.

SEC. 664. Whenever it shall be certified to the Board of Health by the sanitary superintendent that any tenement-house or room therein is so overcrowded that there shall be afforded less than six hundred cubic feet of air to each occupant of such building or room, the said board may, if it deem the same to be wise or necessary, issue an order requiring the

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\* So in the original.

number of occupants of such building or room to be reduced, so that the inmates thereof shall not exceed one person to each six hundred cubic feet of air-space in such building or room. Whenever there shall be more than eight families living in any tenement-house, in which the owner thereof does not reside, there shall be a janitor, housekeeper, or some other responsible person, who shall reside in the said house, and have charge of the same, if the Board of Health shall so require.

SEC. 666. A tenement-house within the meaning of this title shall be taken to mean and include every house building or portion thereof which is rented, leased, let or hired out to be occupied or is occupied as the home or residence of three families or more, living independently of each other, and doing their cooking upon the premises, or by more than two families upon any floor, so living and cooking, but having a common right in the halls, stairways, yards, water-closets, or privies or some of them. A lodging-house shall be taken to mean and include any house or building or portion thereof in which persons are harbored or received or lodged for hire for a single night or for less than a week at one time, or any part of which is let for any person to sleep in, for any term less than a week. A cellar shall be taken to mean and include every basement or lower story of any building or house of which one half or more of the height from the floor to the ceiling is below the level of the street adjoining.

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“... THE MOUNTAIN : In tempest or in calm, the throne of the thunder, or, with the evening sun, painting its dells and declivities in colors dipped in heaven—has been the source of the most absorbing sensations. There stands magnitude, giving the instant impression of a power above man—grandeur, that defies decay—antiquity, that tells of ages unnumbered—beauty, that the touch of time makes only more beautiful—use, exhaustless for the service of man—strength, imperishable as the globe ; the monument of eternity,—the truest earthly emblem of that ever-living, unchangeable, irresistible Majesty, by whom, and for whom, all things were made !”—*Croly*.



EXPERT TESTIMONY.

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DR. F. H. DARBY, of Morrow, O., was imprisoned and fined some months since for refusing to testify as an expert in a certain case unless guaranteed the fee of an expert, and the action created general interest among physicians throughout the State. The Circuit Court by a recent decision upholds that of the Common Pleas upon technical grounds, and without touching the important question as to whether a physician could be compelled to testify as an expert without receiving the fees of an expert. The fact that the doctor voluntarily attended the examination by the coronor made him liable to summons as a witness, in the opinion of the court, without regard to whether his evidence should be in the nature of a knowledge of facts in the premises or of a professional opinion. Messrs. Eltzroth & Thompson, attorneys for the doctor, except to the decision, and will carry the case to the Supreme Court.

*The Lebanon Patriot* of May 5th reports the following interview of Dr. Darby, which will not fail to interest all M.D.'s pending the decision of the higher courts, whether they are obliged to render professional service at the behest of any interested party without reward.

"What do you think of the decision?"

"It looks like a dodge. No one questions the legality of the summons or the propriety of any and all questions as to fact. We were held to be in contempt, fined, and imprisoned by the trial court for drawing the line where *facts* concluded and *expert opinion* began. The court virtually acknowledged its ignorance of the scientific principles involved. It sought to force a vender of such information to give the same without compensation. The said vender declined, whereupon the court, simply because he and his backer, the State, was the biggest man, inflicted, as we claim, erroneously, unusual and illegal penalties. As well might it have taken a book from the shelf of a dealer, or the manuscript from an author and used them without pay. This State does not allow a doctor to practise within its borders unless he is a graduate of some

reputable medical college. To be such will cost him from three to five of the best years of his life and \$3000 to \$5000 in money. To then turn deliberately around and rob him borders at once on vandalism. It is a purely selfish procedure. A victory of might over right. Mean, stingy, picayunish. Something for nothing expresses the situation in a nutshell."

"Will you take it to the Supreme Court of the State?"

"Most assuredly. We will, if possible, go still further and contest the matter in the Supreme Court of the United States. This question, undoubtedly, involves the Constitutional provision that no man can be deprived of life, liberty, or property without due process of law, and that private property cannot be taken for public use without compensation. An expert's special knowledge is private property just as much as a farmer's land, and the court which would take it away from him against his will without paying him for it puts itself directly in line with Henry George."

"Is it not a duty physicians owe to the public to give any facts that may come to their knowledge?"

"Certainly. So far as *facts* are concerned, it is."

"Yes; but should you not, in addition to the facts, go further and instruct the court as to the proper interpretation and application of those facts?"

"No, sir, not for the ordinary fee."

"Does not the public good demand that you give the court the benefit not only of the facts, but of the deductions you are capable of drawing therefrom by reason of your superior knowledge, skill, and experience? Should you not be considered simply an ordinary witness with extraordinary qualifications?"

"No, sir, not without extra pay. These extraordinary qualifications cost money. They are our stock-in-trade—what we have to sell. They are not substantially similar conditions. We believe a long haul is worth more than a short one."

"Well, it is the common belief that your services are necessary to the successful operation of the courts?"

"Yes, and it is likewise a common belief that lawyers, judges, and court officers are necessary to the proper meting out of justice to evil-doers, but they are not compelled, on that account, to give their services without remuneration, and

there is no justice or reason in forcing physicians to do so. It is the right of the State, or anybody else, to thus confiscate our services that we question."

"What do you think of the grounds taken by the court that inasmuch as you assisted at the *post mortem* you were under obligations thereby to fully enlighten not only the coroner's, but all subsequent courts?"

"I think they are too broad. The coroner would, undoubtedly, have the right to interrogate his *post mortem* examiner as to the cause of death, which, in this case, he did; but for subsequent courts that are trying to determine *who* did the killing, not *what* did it, to still lay claim to his services to assist in determining new questions that may arise, is unreasonable and unjust. Having been called to answer to matters of fact, we deny the right to compel us on a continuance of the examination, to answer all hypothetical questions and give opinion evidence *ad infinitum* without at least a reasonable compensation in addition to the ordinary witness fee and mileage. Being brought, as we are, into constant contact with all classes of society, at all times, both night and day, we do more than our share when we give simply the *facts*. We see and hear much more than the average citizen. To testify thereto is a sufficient contribution, without drawing us into the vortex of expert testimony."

"But there is no statute authorizing payment of extra fees."

"Neither is there any for taking opinion evidence *without* pay."

"What have you to suggest in the way of legislation amendatory to existing laws on the subject?"

"A good deal. The whole system of obtaining expert opinion in this State is wrong, radically wrong. At the June session of the State Medical Society we expect to submit a paper embodying the ideas of some of the most advanced thinkers in both the legal and medical professions. This subject has, of late, elicited much discussion. Formerly it was held that all witnesses were on the same footing. Now the opinion obtains that an expert is very much more than an *ordinary witness*; that he is, in fact, a *court officer*. Just as much so as a lawyer or an interpreter. Why, sir, the intricate questions of surgical anatomy, physiology, or pathology are as



much Greek to the judge and jury as the original of Homer's Iliad or the tragedies of Æschylus. Their proper interpretation and application to legal medicine is the great desideratum of both professions. The present practice is fraught with evil. We often see a large array of alleged experts on either side, by which opposing counsel readily prove or disprove anything, everything or nothing, by what is popularly believed, by the public, to be good doctors, but known to the court and counsel to be little else than bribed witnesses. A correction of this, and other evils, is the object of the present agitation. What we want is *fewer* experts and *better* ones—men whose opinions of the scientific features of a given case will be as correct and impartial, and, therefore, have the same weight, as the rulings of the judge on the legal questions involved. How to obtain and retain them in a manner compatible with our American ideas of political equality and economy is a conundrum which engages the attention of many medico-legal minds—one to which we shall address ourselves in the contemplated paper and its discussion."

"What country has the best laws on this subject?"

"Prussia. I am daily expecting a copy of the laws of this, and some other foreign countries, for which I have written. Statutory enactments on this subject have, in many instances, recently undergone considerable change."

"Can you give us a brief synopsis of about what you will recommend?"

"No, sir. There is nothing *brief* about it. I am here to-day to talk with the doctors, Judge O'Neill, Senator Eltzroth, Representative Brown, and other luminaries who may be able to shed light on the subject. For full particulars see large bills."

Here the doctor's well of information pumped dry. We dispatched our devil for a torpedo with which to "blow" him, and the conversation turned on gas and oil.

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THE THERMAL DEATH-POINT OF PATHOGENIC ORGANISMS.  
—An exact knowledge of the thermal death-point of pathogenic organisms is desirable, both as a matter of general scientific interest, and from a practical point of view. As

biologists, we wish to know whether the vital properties of the living protoplasm contained in the minute vegetable organisms in question are destroyed at a uniform temperature, and if so at what temperature; or whether there is a considerable range in the limits of vital resistance to heat exhibited by different organisms of this class. As sanitarians, we wish to know what temperature can be relied upon for the destruction of disease germs in the excreta of patients suffering from typhoid-fever, from cholera, and from other infectious diseases transmitted by means of the alvine discharges of the sick; whether boiling of infected clothing, or of drinking water contaminated with disease germs, is a safe means of disinfection, etc.

Various experimenters have recorded observations with reference to the thermal death-point of different micro-organisms, but the paper by Dr. George M. Sternberg in the July number of the *American Journal of the Medical Sciences* is the first effort at an extended inquiry, by means of a uniform method, with a view to determining the vital resistance to moist heat of the considerable number of pathogenic organisms now known to bacteriologists.

His results permit the following general conclusions to be drawn:

The temperature required to destroy the vitality of pathogenic organisms varies for different organisms.

In the absence of spores, the limits of variations are about 18° F.

A temperature of 132.8° F. is fatal to the bacillus of anthrax, the bacillus of typhoid-fever, the bacillus of glanders, the spirillum of Asiatic cholera, the erysipelas coccus, to the virus of vaccinia, of rinderpest, of sheep-pox, and probably of several other infectious diseases.

A temperature of 143.6° F. is fatal to all of the pathogenic and non-pathogenic organisms tested, in the absence of spores (with the single exception of *sarcina lutea*, which, in one experiment, grew after exposure to this temperature).

A temperature of 212° F. maintained for five minutes destroys the spores of all pathogenic organisms tested.

It is probable that some of the bacilli which are destroyed by a temperature of 140° F. form endogenous spores, which are also destroyed at this temperature.

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## THE ADULTERATION OF FOOD.\*

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By D. H. BECKWITH, M.D., Chairman of the Committee on Adulteration of Foods, Drinks and Drugs, Ohio State Board of Health.

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THERE is probably no more important subject before the thinking public of to-day than the condition of our food supply ; and no subject, in the last decade, relating to the human economy, has received greater consideration or elicited fuller discussion than its contamination through the agency of adulteration.

The wonderful revelations of science have made possible not only the wholesale sophistication of most of our food products, but have provided a way, in numerous cases, for the actual substitution of fraudulent, if not pernicious, substances for many others.

To such an enormous extent has sophistication been carried within the past few years, that legislative action in nearly all civilized countries of the world has been taken, with a view of alleviating, if not relieving, the sufferings of protesting humanity.

It is not the intent of this paper to enter into a discussion of the means of wiping out an industry which has undoubtedly come among us to stay, but rather to encourage such legitimate investigation as may lead our legislators to prompt action toward regulating its workings, whereby we may suffer in least measure from its evils.

While general laws and local police regulations have been in force for a long time in France, Germany, and other European countries respecting the preparation and sale of articles of food, to Great Britain must be awarded the honor of taking the initiative in the enactment of comprehensive laws regarding food adulterations, and to English analysts the proud distinction of being the pioneers in this field of scientific research.

Much opposition to the enforcement of penalties imposed

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\* From advance sheets of First Annual Report of the Ohio State Board of Health.



by these laws has been met with at the hands of prosecuted and interested persons, who have claimed that the methods of detection employed were fallacious, or that results could not be had with any degree of certainty, owing to normal impurities incident to manufacture and subsequent handling ; but these arguments have gone down before the indefatigable efforts of expert professional energy and wise magistration, and in England, France, and Germany, at least, the matter has been so adjusted as to drive most of the pernicious adulteration from the market, and to so regulate the use of other sophistications, not absolutely injurious, as not to deceive the consumer.

At the present time nearly all the adulterations are mere dilutions and substitutions in the interest of pecuniary gain, as exemplified in the dilution of milk with water, and the substitution of glucose for cane syrups, so extensively practised ; careful research showing in nearly all cases that the presence of absolutely pernicious ingredients is the result of accident, and not design. An exception, perhaps, may be noted in the use of alum in damaged flour, but the effects of this adulteration upon the human system are as yet a matter of speculative controversy.

The laws of this country respecting adulteration are moulded after those of England, but are greatly modified, owing to exigencies and complications which have arisen in the different States. The recent passage by Congress of the Oleomargarine bill is the first step taken by the general Government to specifically regulate sophistications ; but even that worthy act sought out rather the protection of the butter industry than the welfare of the consumer.

The wisdom of prohibitory legislation can be seen on our side of the water by the results obtained in Canada. The work of examination there began in 1876, when 51.66 per cent of the articles examined were found adulterated. In six years thereafter, or in 1882, this percentage had been reduced to twenty-five—a remarkable showing, when we consider that the only mode of punishment for infraction of the law has been the publication of the names of guilty parties.

It may be safely asserted that in every locality where the law does not deter from the act adulterated articles are on

sale in all kinds of food supply stores, even the most reputable. Not in all cases by design, perhaps, but for the reason that certain lines of manufactured goods can be had in no other condition, in the ordinary way of trade. Notably is this true of ground spices and condiments, the manufacturers of which carry as capital, and well-paying capital too, receipts for incorporating foreign and worthless substances with the genuine articles. In conversation with the manager of the spice department of a large and reputable house, not long ago, no attempt at concealment of this fact was made. The conception of adulteration in this particular line, he said, lay in a rapid advance of prices for the imported articles at one time, its growth in the gullibility of the consuming public, and its full maturity in the sharp competition of hard times.

In size and price, it may be observed, a box of spice is always the same.

Fluctuations in the prices of imports are counterbalanced by percentage of adulteration; a sort of differentiation which operates nicely for the producer, but sadly deranges the digestion of the consumer.

The amount of evidence relating to the subject of food adulteration, offered in the publications of health boards in various parts of the country, is enormous. To attempt a retrospect even at this time would be a work of supererogation.

A few facts which have been gathered from observation and research are presented herewith, as additions in a modest way to the vast array of evidence already in.

These investigations have been carried on in the face of many difficulties.

The provision of proper appliances, the press of time, and the preparation of certain reagents for laboratory work, which could be obtained in no other way, must serve as apologies for the meagreness of facts detailed. The methods of examination, however, have been critical, those employed by practical chemists of to-day being closely followed, and the determinations, wherever necessary, quantitative.

The samples examined were purchased in various parts of Cleveland, in a regular way, and generally without exciting any suspicions as to their destination.

The investigations began with

## GLUCOSE.

And in view of the fact that about ten pounds of this product are manufactured in the United States for every man, woman, and child therein, annually, and that Cleveland is not quarantined against the rest of the country, a two hours' fruitless search for a small sample to be used in comparative analysis was certainly discouraging. Druggists, wholesale and retail, had none, but, with singular unanimity, referred the inquirer to the candy manufacturers, who, to a man, knew nothing of the commodity.

Parenthetically, a specimen of taffy of another kind, abstracted from an inviting pile, yielded seventy-nine per cent of glucose on analysis.

Glucose is probably the leading adulterant upon the market. It is largely used in syrups, low-grade sugars, jellies, and cheap confections.

As artificially prepared it differs materially from cane sugar, having but about one third the latter's sweetening power and being devoid of color when in solution. It is frequently contaminated by the lime which is used to neutralize the sulphuric acid employed in the conversion of the starch into sugar.

Free acid is also claimed to be occasionally found. The presence of lime in the ash of sugars or syrups, obtained by burning off the organic matter and carbon, is a good indication of glucose adulteration in the example under estimation.

The cheapness of glucose, together with its close relationship to cane sugar, enables the refiner to use it extensively as a sophistication at a handsome profit, and without fear of detection when shipped to country storekeepers and city dealers in localities where sanitary laws are not rigorously enforced.

*Per se*, glucose is wholesome and nutritious. Its production encourages corn growing, increases the sugar supply, and offers employment to capital and labor. So far the industry which it represents should be encouraged, but its sale as cane sugar is a fraud, and should be as completely tabooed as the sale of artificial butter for the genuine article. Its cheapness and poverty in saccharine matter demand its complete isolation.

In Europe glucose is largely prepared from potatoes; in this country, on account of its greater abundance, from corn,



whence the names corn-sugar and corn-syrup, in common use. The starch which the corn contains is washed out after the grain has been steeped in warm water and ground into a pasty mass. It is then alkalized to remove the nitrogenous matter, washed, and converted at the boiling point of water with dilute sulphuric acid. The acid glucose solution is then neutralized with marble dust, the sulphuric acid forming with the lime a calcic sulphate, which, being insoluble in water, is easily separated by subsidence. Finally, to remove any traces of free acid which might accidentally remain, the solution is drawn off and agitated with lime milk.

Seven examples of syrups were purchased for analysis, principally to determine the extent of glucose adulteration.

These were bought at as many different retail stores in various parts of the city, and were in each case guaranteed free from adulteration. With Fehling's solution six of them were found to contain abnormal amounts of glucose.

The seventh, dark and unprepossessing in appearance, contained less than four per cent, about the usual quantity normal to cane sugars. The following table shows the complete result :

No. 1, warranted cane, yielded	....	23.19 per cent glucose.
No. 2                   "                   "	....	19.76       "       "
No. 3                   "                   "	....	29.30       "       "
No. 4                   "                   "	....	43.06       "       "
No. 5                   "                   "	....	3.97       "       "
No. 6                   "                   "	....	16.15       "       "
No. 7                   "                   "	....	31.68       "       "

Two of these, numbers two and six, the lightest colored in the group, were incinerated, and tested for the salts of tin, which are quite often used as bleaching agents, with the following results :

No. 2, 26 800-1000 grms. contained 231 mgrs. of ash and a free precipitate of iron sulphide, which was not weighed.

No. 6, 13 960-1000 grms. contained 184 grms. ash and 113 mgrs. of tin sulphide; the tin was precipitated from chlorhydric solution by hydric sulphide. (The presence of iron in No. 2 is not accounted for.) The chlorides of tin are poisons, being classed as such by Taylor and others.

## BREAD.

It has been claimed by many writers on sanitary subjects that the practice of adulterating bread is of rare occurrence in the United States ; but the prominence of the alum question at the present time is significant of a different state of affairs. The reports of boards of health, and columns of sanitary journals, teem with essays on this important subject. The controversy among medical writers respecting the effect of this drug upon the system has had the effect of encouraging its use, even by those who would desist from using it were it settled that its effects were injurious.

It is a well-known fact that when wheat is exposed at harvest-time, in transportation or in storage, to heat and moisture, it deteriorates. This is true as well of flour made from well-harvested and carefully-stored grain. Technically speaking, the deterioration has been caused by the albumen passing into a peculiar state called diastase.

Good bread from such flour is impossible, except by the addition of alum, which arrests the conversion of starch into dextrine and sugar. Without the alum the bread would be quite unsalable, would be sweet, sticky, and heavy, and not light and porous as it should be.

The dark color in graham bread is not due wholly to the presence of dark-colored particles of bran, but rather to certain peculiar nitrogenous ingredients in the bran, which are especially active in bringing about this state of diastase.

Careful separation of the bran in a graham loaf, and comparison of the remaining crumb with the crumb of white bread, will show this. Therefore, without the intervention of some neutral agent graham bread should exhibit some of the characteristics of loaves made from damaged flour, and the analyst might be well rewarded by exploring this particular field. Aside from the consideration of health, the use of alum as a vehicle to run unfit food upon the market should certainly be prohibited. But if alum arrests the decomposition before the bread is taken into the stomach, why does it not in a measure prevent the dissolution of the gluten during assimilation ?

Analyses of all the white and graham breads accessible in Cleveland resulted in the finding of alum in but one sample, a four-cent loaf, from one of the largest bakeries in the city.

In the examination of flours no impurities of a deleterious character were found.

The microscope was not brought into requisition, so that no report can be made upon foreign starches.

The practice of using ammonium carbonate in cake has been acknowledged, but not investigated.

#### CANNED GOODS.

Fruits, vegetables, and meats put up in tin packages deserve more attention than the limited time available in the preparation of this paper permitted.

But for an unfortunate circumstance which placed a store-keeper on his guard, several cans of "swelled head" vegetables would have been tested and reported upon. Becoming suspicious from the too critical examination of his wares, he refused to sell, and withdrew the suspected goods. He volunteered the statement, however, that job lots of such goods were sold by wholesale houses to out-of-the-way grocers after the new stock had been received, and that plenty of "swelled heads" could be found next month. This was the only lot found which excited any suspicion; but the close of the season will bring out old stocks, and present a fair field for investigation.

#### MILK.

But one sample of this universal diet was subjected to analysis, and that one proved all that could be desired.

The mere inspection of milk, as generally practised, is not sufficient to determine some of the most injurious contaminations. Even careful chemical analysis sometimes fails to detect poisonous secretions in the milk of cows. In some parts of the South, and even in this State, there is a particular malady known as "milk-sickness," confined to certain infected localities, produced by the milk of cows which graze upon the herbages in the natural woods. This disease may be transmitted as well by the products of the milk. The cows, however, show no evidence of disease, but are apparently healthy in most cases.

There are also many well-authenticated cases of the poisoning of people through the medium of the milk of cows which



have eaten hyssop, spruce (buck-eye), *æsculus glabra*, and other poisonous substances, and it is universally known that milk instantly reveals any change to feed, having a peculiar or easily recognizable taste or smell, like turnips or wild parsnips. In the light of these facts, what may be said of the intentional impoverishment and contamination of milk by the feeding of distillery waste, brewers' grains, glucose, and garbage, which is openly practised in the city of Cleveland by unscrupulous venders?

#### VINEGARS.

But little, if any, cider vinegar is exposed for sale. Of a dozen samples examined not one was found to contain enough malic acid to form more than the faintest precipitate of lead malate, upon the addition of lead acetate, a simple but effective qualitative determination.

An examination of the reports of analysts, employed by the boards in different States, will reveal the fact that about all of our food supply is largely adulterated. Household articles, according to the following table, compiled by Dr. Newton, of New Jersey, suffer to an alarming extent. The table is appended :

Spices and condiments.....	66 per cent.
Ground coffee.....	45 per cent.
Tea.....	48 per cent.
Lower grade sugar.....	20 per cent.
Syrups.....	50 per cent.
Milk, when not inspected .....	50 per cent.
Flour.....	none.
Bread .....	2 per cent.
Cream Tartar and baking powder.....	44 per cent.
Butter (substitution of other fats).....	40 per cent.
Vinegar.....	rarely cider
Olive oil.....	60 per cent.

If figures do not lie and scientific research deceive, we surely have in this table a finger-board to the path of professional duty for this and other health boards throughout the United States.

## HEATING AND VENTILATION.\*

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By T. CLARKE MILLER, M.D., President and Chairman of the Committee on Heating, Ventilation, etc., Ohio State Board of Health.

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AMONG the problems which present themselves to the practical sanitarian, probably none are of greater importance, and few, if any, are surrounded by so many hindrances to practical solution as this—How can we secure an artificial climate indoors, possessing the conditions favorable to health, while the temperature in the open air ranges from zero downward?

A comfortable degree of heat is the most palpable requirement, and is the first, and usually the only demand of a vast majority of our people of inferior intelligence, and even those of average or fairly good information are indifferent to the qualities of the air in other regards.

The most imperative demand, in a hygienic sense, is that the air should be free from a dangerously large admixture of poisonous gases and imponderable products of physiological and pathological decay.

People may be brought to realize the dangers to be apprehended from the adulteration of food. It is more difficult, though it may be possible, to bring them to a practical recognition of the peril that lurks in water derived from a polluted source; but the air, which many times a minute enters the body through most delicate organs and comes in almost immediate contact with the warm life blood, is rarely thought of with misgivings, unless its *temperature* becomes uncomfortably low or high.

Now, low temperature may be compensated by proportionately increasing the clothing, and high temperature, within climatic limits, by lightening the covering of the body, but *polluted air* is utterly irremediable. The gigantic initial task of the sanitarian is to impress upon the people the fact that the impalpable substance which woes in the zephyr and spurns in the blizzard may, in its mood of quiet and sensible non-

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\* From advance sheets of First Annual Report of the Ohio State Board of Health.

entity, teem with dangers to health and life—that the air we breathe, though the breath of life when once inspired becomes the very atmosphere of death when rebreathed.

It is curious and startling, when we remember the disgust awakened by ordinary and comparatively innocent excrementitious products, to see the utter and unconscious indifference to an atmosphere loaded with physiological waste and robbed of its life conserving oxygen, which has run the gauntlet of foul eructations from disordered and maltreated stomachs, viscid bronchial mucous, and throats and noses riddled by nameless diseases.

Fresh air is accessible in great profusion out of doors, but the other conditions, those most sensible, and consequently most urgently insisted on, cannot be enjoyed in a natural climate, at or below zero. The sensations awakened by low temperature have almost, if not quite, as imperious dominion as the demands of the organism for food.

A comfortably high temperature is a very great hygienic necessity, but it is a need that will not fail to urge itself. The sanitarian must be able to make a local climate—within walls—which, while it is comfortably warm, shall also be safely pure. He must give *voice* to the speechless requirements of good health ; we can better afford to lack in heat than we can to abound in poisoned air.

The *speculative* sanitarian recognizes the necessity for pure air ; he may be able to give the exact components of a wholesome, respirable atmosphere, or he may even have the skill to make a qualitative and quantitative analysis of impure air. The *practical* sanitarian must *know* and *be able to show how* impure air is to be disposed of and replaced by pure and comfortable air.

Ventilation and warming are wedded “for better or for worse ;” the principles involved in either cannot be elaborated while the other is ignored or neglected.

A most pressing necessity exists for the application of correct principles to the warming and ventilation of buildings occupied by human beings, and perhaps more especially to that class of structures designed for the occupancy of a large number of people for many consecutive hours, such as school-houses, churches, court-houses, legislative halls, etc.



It would be interesting to study the agencies of foul air in warping characters, in spite of otherwise excellent educational facilities—in inaugurating fantastic theological deviations, in confusing juries and witnesses, and even judges—and in bringing about unwise or pernicious legislation ; but the mental and moral aspects of sanitary science are not under consideration, yet in the name of the most advanced sanitary thought may we not stake off a claim in the mental and moral field ?

The conservation of health and economy in human life demand something better than we have had ; and the necessity of educating the people would suggest that every place of public entertainment or assembly, and most certainly every institution that is under the control of the State or that aims at the enlightenment of the people, should, in the location, construction, and surrounding of its buildings, be an object lesson in sanitary science.

In setting forth some of the simpler principles underlying proper and effective methods of warming and ventilation, I shall not concern myself much about originality ; such concern would be useless, since I only propose to formulate familiar elementary principles. Repetition may be as forcible and effective as the enunciation of new truths ; reflected light, though it may lack the penetrating intensity of direct rays, may illuminate places not reached by the latter.

There is no way at present known by which we can purify polluted air and render it again fit to be breathed. The ventilation of a room is the process of removing the air which has become useless and hurtful, by reason of its foulness, and replacing it by air which satisfies the requirements of healthy respiration ; the poisoned air must be taken out and fresh air admitted. The practical result of this double process, under the most favorable circumstances, are to dilute the foul air and maintain a state of tolerable foulness or proximate purity. There is only one source of supply—namely, the great mass of the atmosphere which is drawn from at some point, outside the building, not liable to local, contaminating influences. Special care must be taken that this fresh air receive no added constituents, and that it be deprived of none of its native qualities in its passage to the rooms in need of it. Sufficient openings must be provided for the admission of fresh air to

the required amount, as well as for the exit of an equal volume of foul air displaced. Many a heating apparatus has been rendered valueless, even as old iron, and tons of fuel have been destroyed in the attempt to warm buildings by driving hot air into rooms already as full as possible, and without provision for the escape of air in as great amount as that sought to be driven in. The method of heating by stoves, placed in the rooms to be warmed, usually ignores the necessity of a supply of fresh air; with a close stove, of course, the only dependence is in cracks about the windows and walls in general, and also to the more or less frequent opening of doors or windows. An open stove takes out a considerable volume of air, which is replaced by windows, doors, and crevices; the air taken in is cold while that taken out is warm, consequently the purer the air in the room the colder it is. An open stove is better than a close stove, and as even a close stove takes out some air to supply its draft, it is better than surfaces heated by steam or hot water, which supply heat by direct radiation, but neither take out foul air nor bring in fresh. This being true, the direct radiation method of warming, while it may answer, in a manner, for rooms little used or having open walls, is poorly, if at all adapted to well-closed buildings, occupied by large numbers of people. The sanitarian, therefore, cannot countenance the warming of school-rooms, churches, court-rooms, legislative halls, etc., etc., by stoves, and even less by direct radiation, alone, from surfaces heated by steam or hot water.

In order to ventilate a room properly we must provide for the discharge of air as rapidly as the process of contamination goes on; the rapidity of this process will depend on the size of the room and the number, proportionately, of its occupants. This also contemplates, necessarily, the admission of a like volume of fresh air.

In order that a room may be properly warmed the fresh air must be warmed as fast as, or before being admitted to the room, in volume fully equal to the air taken out—that is, as rapidly as contamination takes place.

The heating apparatus should be of sufficient power to warm all the air necessary, in order that the air in the rooms may be kept fresh. It should present a large heating surface to the

air, and should be only moderately heated. It is probable that iron made red hot does not, as some suppose, allow the gases of combustion to pass through its pores, yet there is no doubt but air may be rendered less wholesome by passing over surfaces heated to redness or whiteness. If there should be insufficient surface it must be over-heated, in order to produce a comfortable degree of warmth in the rooms.

All this contemplates ample communication with the outside air, as well as pipes and registers abundantly large.

Having provided for an abundance of warm, fresh air, it is most economically admitted at or near the floor. It is not absolutely imperative that this should be the case, yet, under certain circumstances, it is very desirable that, for a short time at least, the body or feet should be exposed to a degree of heat greater than the general temperature of the room. The warm air naturally rises without much disposition to diffusion until it reaches the ceiling, and as it parts with its heat it becomes relatively heavier and is disposed again to descend. As the air becomes foul it also becomes relatively heavier. The ventilating openings should consequently be at the floor, in order that the foulest air as well as the coldest may be taken out and replaced by the warmer, purer air in the higher parts of the room.

Simplicity in principle will be largely favorable to satisfactory results, as you cannot secure a philosopher and mechanical engineer for every heating apparatus. The movement of air through the rooms should be in obedience to natural law—as nearly as possible self-acting or automatic; ventilating flues in their capacity must be proportioned to the size of the rooms and the number of occupants, and must have a good draft. It must not be presumed that all flues will draw. The residue of heat remaining in the air when it is taken out of the room will favor its ascent in a flue; this will often, perhaps generally, secure the necessary draft, but this is sometimes to be further assisted by a gas jet burning in the ventilating flue or a small independent heater placed at the base of large flues having a large amount of work to perform. Some such provision should be made, in order that it may be available in certain states of the atmosphere unfavorable to the normal action of the flue, and it must not be forgotten

that success in warming, as well as in ventilation, will depend on the efficiency of the flues, as the aspirating power of the ventilating flues is ultimately felt at the opening which admits fresh air from outside the building.

An ordinary school-room contains about 12,000 cubic feet of air space. If we allow twenty-five cubic feet of air to a scholar per minute, forty scholars would use and disable 1000 cubic feet per minute, and would render the whole amount of air, in the room, unfit for use in twelve minutes, and unless the ventilating flues have the capacity for removing 12,000 cubic feet of air five times every hour, the air will progressively become impure. I understand well enough that I am not over-liberal in the size of the supposed room, in the allowance of air to each scholar, and that I *am* over-liberal in the number of scholars; but sanitarians may well be happy when our schools come up to these minimum requirements.

In dwellings a combination of the direct and indirect methods of heating may be allowed, but the direct method alone is intolerable, even then, while in rooms where a large number of people are gathered and remain for hours, the direct method cannot be tolerated at all unless to supplement the indirect method after a sufficiently rapid change of air has been secured.

#### SUMMARY.

1. Warming and ventilation are inseparable questions from a hygienic point of view.
2. The air in a room when foul can only be made pure by displacement.
3. Air cannot be taken out of a room more rapidly than it is replaced by air admitted to the room.
4. Warm air cannot be driven into a room in greater quantity than the volume of air taken out.
5. The air in an occupied room, heated by stoves or other radiators placed in the room, is made warm at the expense of purity, or pure at the expense of warmth.
6. A room properly ventilated must discharge air as rapidly as contamination goes on, and receive an equal volume of fresh air.
7. A room properly warmed must receive warm, fresh air as rapidly as the foul, chilled air is taken out.



8. The heating apparatus should offer, to the air passing through it, a large surface, moderately heated, in order that a large volume of air—warm rather than hot—may enter the rooms.

9. Warm air, owing to its relative levity, should be admitted at, or near, the floor.

10. Foul air, owing to its relative gravity, must, together with chilled air, be taken out at the floor.

11. Special care must be taken that the fresh air is not contaminated before entering the building, or at any point in its passage to the rooms.

12. The movement of air through the rooms should be in automatic obedience to natural laws.

13. The capacity of the ventilating flues must have reference to the size of rooms and the number of occupants.

14. A good draft must be secured in ventilating flues, not only to take out foul air, but to bring in fresh, warm air.

15. At least twenty-five cubic feet of air per minute should be supplied to each occupant of a room.

NOTE.—A room of the size indicated would be a very fair size for 136 pupils; but practically it will often be necessary to admit a greater number. Experience teaches us that frequently the school year closes with rooms to spare, yet the succeeding year opens with a lack of rooms; so that it is impossible to absolutely fix, within proper sanitary limits, the number of scholars to be admitted to each room.

It would be desirable to change the air more rapidly than indicated above, but practically it is a question whether this can be done and yet maintain a comfortable temperature in very cold weather, with stormy winds, unless we introduce a heating apparatus, which would seem to be out of proportion to the space to be warmed.

It is possible to present a very imposing array of figures, setting forth the amount of air space required, the size of ventilating flues, the rapidity of upward currents in these flues, etc., etc., all based on a more or less accurate estimate of the percentage of  $\text{CO}_2$  present—or which, at least, ought to be present, if the producers accomplish what is to be expected of them. But a lively north-wester, with the thermometer  $12^\circ$  to  $15^\circ$  below zero, is liable to disturb the relations of these

figures, and bring about the necessity of a new arrangement which shall take into account the extent of heating surface required and the degree to which it must be brought in order to supply the requisite volume of air, warm enough to enable us to enjoy and appreciate its freshness. While we aim at the ideal, let us by all means not fail to secure the limit of the possible.

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## THE THERAPEUTIC EFFECTS OF SEA AIR.

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THE season of the year is now at hand when the dwellers in large cities begin to contemplate their usual summer recourse to the seaside. This practice is one of very ancient date, if we regard only the wealthy and leisured classes, but its general adoption is a more modern habit. The Roman noble sought refuge from the summer heat of Rome at Baiæ and Paestum, but he was not followed thither by the trader or farmer, and still less by the artisan and mechanic. In modern times, however, almost all classes, except the very poorest, participate, more or less, in the custom of seeking to exchange for a time the heavy and vitiated atmosphere of large cities for the refreshing breath of ocean. It is worth while to inquire the *rationale* of this custom, the benefits to be expected from it, and the classes of individuals to whom it is especially applicable. We have, first of all, to take into account the simple element of change. Monotony of occupation and diet is, in the long run, injurious to the organism; and change of air operates beneficially by inducing change of habit and of food, and by turning the current of life into fresh channels. It is not desirable that such a change should be from one extreme to another, such as from a very damp and relaxing atmosphere to a dry and stimulating one, or from a confined and sedentary life to one of boisterous activity. By such extreme changes the system is apt to be overtaxed, and, instead of renewal of health, too often the result is disturbance of sleep and digestion, and the induction of nervous exhaustion.

But the resort to the seaside means much more than mere change of air. It involves the exchange of a more or less vitiated atmosphere for one of almost perfect purity, and the

substitution of tonic and bracing conditions for those that are usually relaxing and depressent. Sea air is free from all sources of organic contamination ; it possesses much ozone, and traces of bromine and iodine. Hence, it is highly tonic and alterative, if we may still use a somewhat objectionable term, for which we are yet without any satisfactory substitute. The air at the seaside is also in almost constant motion ; and this factor has its influence in increasing the tonic and bracing effect. In favorable cases, sea air produces a marked augmentation of appetite, increased desire for sleep, and a proportionate improvement of nutrition. These three factors are usually closely associated, and the effect of sea air may be accurately gauged by its influence upon appetite and sleep. The increased drowsiness at the seaside is often, for a time, accompanied by a feeling of agreeable languor, which usually gives place to one of renewed energy. The purity of the air, the presence of ozone, and the stimulation of appetite, afford the requisite conditions for improved sanguification ; while the fresh-air life and habits of healthful activity tend to the improvement of muscular and nervous tone.

Thus, in a very large proportion of cases sea air is beneficial. It suits especially those who are organically sound, and merely exhausted by excessive work or prolonged confinement in impure air. It affords the desired fillip to the energies of those who require a little recuperation for the performance of fresh labors. In most cases it is admirably adapted to the needs of children, who delight in the fresh atmosphere, the easy, careless life, and the facilities for out-of-door amusement. We may lay down, in general terms, that sea air suits the majority of people who are in average health, and tends to promote the increased well-being of those who are already well. Its application to cases of disease is more difficult and disputable. That sea air is, in many cases, an admirable restorative and a powerful means of changing morbid action, and hastening convalescence, is undoubted ; but as little can it be denied that it is often improperly recommended and fruitful in mischief. The chief therapeutic effect of sea air is its stimulating property ; and in considering its application to disease, the first point to be determined is whether the patient is in a condition to bear stimulation. Many diseases require

soothing rather than stimulating ; and, in such cases, sea air is contraindicated. Thus, in all cases of nervous excitement, hysteria, and allied conditions, the desideratum is to quiet nervous action rather than stimulate an activity which is already abnormal. Here sea air is likely to do nothing but harm, and should be avoided.

Again, in convalescence from acute disease, it is always a nice point to determine when the patient has rallied sufficiently to be able to react to the stimulation of sea air. In retarded recovery from typhoid-fever, pneumonia, and other acute specific maladies, few things are more worthy of the nicest consideration of the practitioner. On his accurate diagnosis of this point will turn his decision, whether his patient should continue to enjoy the rest and quiet of his home, or try to hasten recovery by recourse to the seaside. Two points seem of special importance in the determination of this question—viz., temperature and the condition of the nervous system. If the temperature be normal, and the nervous system fairly quiet, sea air may reasonably be expected to operate beneficially. If pyrexia and nervous irritation be still present, it is very apt to promote a recrudescence of disease.

There are some constitutional conditions which bear stimulation well, and these may be expected to benefit decidedly by resort to the seaside. Of such cases, struma affords the best instance in point. Rickety children may also be confidently ordered to the seaside, as statistics show that rickets is relatively rare at marine localities. In hereditary predisposition to phthisis, sea air seems almost uniformly beneficial. Many people suffer from disordered hepatic action at the seaside, and some cutaneous affections, especially eczema, are aggravated by sea air. These facts point their own moral. In all cases where sea air seems too stimulating, its exciting action may be reduced by choosing a residence that does not face the sea, by taking inland walks, and by abstinence from bathing.

—*The British Medical Journal.*



## EDITOR'S TABLE.

THE AMERICAN PUBLIC HEALTH ASSOCIATION, we are gratified to observe, has every prospect of the heartiest of welcomes at its forthcoming meeting in Memphis, November 8th-11th, and it is sincerely to be hoped that every member of the Association will show a realizing sense of the purpose for which it was created, by devoting his best energies to the promotion of the public health. The good work has already begun under the energetic action of Dr. G. B. Thornton, President of the Memphis Board of Health, and Chairman of the Committee of Arrangements, by a call of the resident members of the Association and the organization of such committees of coworkers as promises every detail for an eminently successful meeting. Dr. Thornton is Chairman of the General Committee, which consists of seventy members, and *ex-officio* member of the other committees, severally, all numerous in membership, and composed of representative citizens, as follows: On *Finance*, Dr. T. D. Porter, Chairman; *Transportation*, Major M. Burke, Chairman; *Publication and Printing*, Dr. T. L. Sim, Chairman; *Entertainment and Reception*, Dr. R. W. Mitchell, Chairman. The membership of these committees is an earnest of the spirit of Memphis in the cause of public health.

The Executive Committee of the Association has selected the following comprehensive subjects for consideration :

- I. The Pollution of Water Supplies.
- II. The Disposal of Refuse Matter of Cities.
- III. The Disposal of Refuse Matter of Villages, Summer Resorts, and Tenements.
- IV. Animal Diseases Dangerous to Man.

The Association is competent to deal with such subjects in all of their relations, and it has need to be alive to such as time and sense have shown to be incidental to its own processes of practical work. Time was, some years ago, when there were very few ex-Presidents of the Association, and those few seem to have got the proposition into their heads, or into their taste of office, that, on having once been made president they should continue their official relations perpetually, and to provide for

this they had the constitution so amended as to add all ex-Presidents to the Executive Committee, which was already abundantly large for good executive work, but with a sufficiently large proportion of members, elected annually, to secure its legitimate relation to the general body. But it is now so completely overwhelmed by the number of ex-Presidents as to have well-nigh lost its true relations, and instead of exercising its functions "generally to superintend the interests of the Association and execute all such duties as may from time to time be committed to them (it) by the Association," it seems to have changed places with the Association—it has practically transformed itself into a governing body to the execution of such work as is, from time to time, committed to it by the Executive Committee.

Moreover, the ex-Presidents are also eligible and are frequently appointed to membership in the Advisory Council, thus being not only perpetual office-holders but office-makers, the Judicial Council being the nominating committee of officers for each ensuing year.

These conditions are, in a sense, polluting, and they should be disposed of. Article IX. of the Constitution, title, Executive Committee, should be amended by striking out the last clause, which reads, "and of the ex-Presidents of the Association." And Article X., title, Advisory Council, should be amended, after the word "year" in the fifth line, which reads "as a nominating committee of officers for the ensuing year," by adding : none of whom shall be members of its own body.

THE LOMB PRIZE ESSAYS.—It is pretty generally known, among sanitarians at least, that Mr. Henry Lomb, the eminent microscope-maker of Rochester, N. Y., offered through the American Public Health Association several valuable prizes for the best essays on sanitary subjects. The volume before us contains four essays for which prizes have already been awarded. The subjects of these are, 1st. "Healthy Homes and Food for the Working Classes," by Victor C. Vaughan, M.D., Ph.D., University of Michigan; 2d. "The Sanitary Conditions and Necessities of School-houses and School Life," by D. F. Lincoln, M.D., Boston, Mass.; 3d. "Disinfection and Individual Prophylaxis Against Infectious

Diseases," by George M. Sternberg, M.D., U. S. A.; and 4th. "Preventable Causes of Disease, Injury and Death in American Manufactories and Workshops, and the Best Means and Appliances for Preventing and Avoiding Them," by George H. Ireland, Springfield, Mass.

These essays are published according to the wishes of Mr. Lomb, the benefactor, to aid people generally in making their homes healthful, to teach them what foods are wholesome, how to avoid all causes of disease in school children, and to teach the simplest methods of disinfection and care for the prevention of infectious diseases. These essays have now reached a second edition, and are offered to the public at a small nominal price, bound or unbound. The unbound pamphlets are issued either collectively or each one separately, and can be had for distribution at a very small cost; indeed, the Secretary of the Association, Dr. Irving A. Watson, Concord, N. H., is authorized to present a copy of either of these essays, or all of them, to any one who will promise to read them, and we heartily commend them as among the most profitable of all literature.

REPORT OF THE COMMITTEE ON DISINFECTANTS, at the Fourth Annual Meeting of the American Public Health Association, Toronto, 1886.—This abstract of 32 pages from the forthcoming volume of Reports and Proceedings of the American Public Health Association, deserves the widest possible circulation among importers and others interested in the means necessary for the prevention of the introduction of disease by commerce. It is exclusively devoted to the most reliable of all means of disinfection—*heat*, and chiefly by steam (previous reports of the same committee having very thoroughly covered the whole ground of disinfection by other means). The various kinds of apparatus used for the purpose are described under three heads: 1. Those in which dry hot air is used. 2. Those in which moist hot air is used; and 3. Those in which steam is the disinfecting agent. The conclusion of the last preceding report is repeated, namely, that *dry* hot air cannot be relied upon for disinfection when great penetrating power is required, as in disinfecting mattresses, feather-beds, and thick bundles of clothing, etc., nor under any circum-

stances unless a temperature above  $110^{\circ}$  C. ( $230^{\circ}$  F.) has been maintained for upward of two hours.

The report wholly omits any notice of several reports and papers on the use of steam as a disinfectant, in the proceedings of the Sanitary Convention in 1860, the Transactions of the Medical Society of the State of New York, 1864-68, and of the steam disinfecting chamber of the New York Quarantine establishment, constructed in 1870, which, for the disinfection of clothing, bedding, etc., has not been improved upon by the more recent devices.

The committee confirms its conclusion previously reported, and recommends—

“Steam under pressure at  $110^{\circ}$  C. ( $230^{\circ}$  F.) for ten minutes ; dry heat at  $110^{\circ}$  C. ( $230^{\circ}$  F.), for two hours in the absence of spores ; and boiling in water for one half to one hour, as the most efficient non-destructive disinfectants.” And

“The committee desires to express its conviction, based upon the practical experience of some of its members, that the use of steam, and especially when superheated or under pressure, is the most efficient agent for the destruction of all sorts of infectious material.”

Of thirteen illustrated devices for the application of heat in various countries and places described, nine are *patent*, and the rest are chiefly for the application of dry heat ; this ought to set at rest the misrepresentations of the rag importers and others, in New York and Boston, particularly, who have exerted themselves to make the most reliable process of disinfection odious because it is covered by a patent.

DEADLY EMIGRANT SHIPS.—Nothing can better illustrate the importance of more stringent laws relative to sanitary and medical service on board immigrant passenger vessels, as recently reported upon by a Committee of the American Medical Association, than the following :

“BOSTON, July 8.

“When the steamer Prussian, of the Allan Line, arrived at this port from Glasgow, a few weeks ago, sixty-five of the steerage passengers were found to be ill with typhoid-fever. The Board of Health decided to make an investigation, and some of the water which was used on the steamer for drinking



purposes was sent to Dr. Harold C. Ernst, the bacteriologist, of Harvard University, and analyzed. This morning Dr. Ernst made his report. He says that he finds evidence of dangerous impurities, and that the water is totally unfit to drink. The Board of Health will take the matter in hand."

But what can the Board of Health do under the loose provisions of an immigration law through which a fleet of immigrant passenger vessels sails every week in the year? "A duly qualified and competent surgeon or medical practitioner," on an immigrant ship-master's standard, is one who accommodates himself to the status and pay of the steerage cook, and who would be considered unfit for his duty—to attend to the sick—if he should presume to examine the water or food served out to passengers—*that* is none of his business.

PAUPER IMMIGRANTS.—The current discussion on pauper immigration has led the Troy (N. Y.) *Times* to investigate the cost to which Rensselaer County is put to maintain its paupers of foreign birth. Of the 794 inmates of its county house, 535 are foreign born. According to this showing, two thirds of the burden thrown upon the tax-payers for sustaining the county poor is due to immigration. In perhaps a majority of the counties of the Eastern States the same condition of things would be discovered if an investigation were made. The *Times* claims also that the jail and penitentiary tell the same story. It asserts that the assisted emigrant's ambition after arriving in this country is to get housed in some comfortable prison where the fare and accommodations are superior to those he is accustomed to in his native land. The disclosure of these facts ought quickly to arouse such a strong public sentiment against this abuse that the general Government will be compelled to take effectual measures to abate it.

CATTLE AS A SOURCE OF SCARLET-FEVER IS NO NEW THING.—Readers of THE SANITARIAN only need refer to a series of papers in Volume XI., by our esteemed collaborator, John C. Peters, M.D., of New York, to learn that it was well recognized more than three centuries ago. Dr. Klein's recent discovery of the morphological identity of a micrococcus found in the blood of human scarlet-fever patients with that obtained and cultivated from certain cows affected with a simi-

lar disease is, therefore, confirmatory only of a long since well-established truth. Measles, diphtheria, and several other diseases hold the same relation.

SEWER-GAS POISONING.—At the recent meeting of the Association of American Physicians, in Washington, Dr. Henry Hun, of Albany, N. Y., reported in detail the histories of twenty-nine cases that had come under his observation, in which various diseases appeared to have been due to the inhalation of sewer-gas. He thought it probable that the following diseases may result from sewer-gas poisoning: Vomiting and purging, separately or combined; general debility, fever, sore throat of a diphtheritic type, neuralgia, and, perhaps, also, myelitis of the anterior horns. These conditions are frequently combined. Fever is frequently associated with the other symptoms. There is one group of symptoms which is almost always present—that is, loss of appetite, extreme prostration, and pain in the head. When this occurs as a chronic condition we are justified in suspecting that the patient is suffering from sewer-gas poisoning.

#### MORTALITY AND MORBILITY STATISTICS AT THE MOST RECENT DATES.

CALIFORNIA.—The mortality for the month of May, reported by the Secretary of the State Board of Health from 90 localities, containing an estimated population of 653,650, was 870. Consumption, 139—a decrease of 7 from March; pneumonia, 56—an increase of 15 from March; bronchitis, 11; congestion of the lungs, 10; diphtheria and croup, 33; typhoid-fever, 17—11 in San Francisco; cerebro-spinal meningitis, 14.

*San Francisco*, in a population of 300,000, reports the number of deaths for May, 475; from diphtheria and croup, 24; typhoid-fever, 11; consumption, 67; pneumonia, 36. Death-rate, 18.61.

Six cases of small-pox occurred in Los Angeles, which were treated in the small-pox hospital.

CONNECTICUT.—For the month of May, 1887, the mortality and chief causes of death in ten cities were as follows:

*Bridgeport*, 41 ; zymotic diseases, 13 ; phthisis, 3 ; pneumonia, 4 ; heart disease, 2. Deaths under five, 14.

*Hartford*, 75 ; zymotic diseases, 8 ; phthisis, 9 ; pneumonia, 14 ; heart disease, 7 ; nervous diseases, 11. Deaths under five, 14.

*Meriden*, 18 ; zymotic diseases, 2 ; phthisis, 6 ; nervous diseases, 3 ; pneumonia, 2. Deaths under five, 4.

*Middletown*, 30 ; zymotic diseases, 5 ; phthisis, 5 ; pneumonia, 1 ; nervous diseases, 6 ; heart disease, 2. Deaths under five, 4.

*New Britain*, 27 ; zymotic diseases, 2 ; phthisis, 4 ; pneumonia, 8. Deaths under five, 8.

*New Haven*, 97 ; zymotic diseases, 13 ; phthisis, 12 ; pneumonia, 14 ; nervous diseases, 12 ; heart disease, 6. Deaths under five, 35.

*New London*, 16 ; zymotic diseases, 3 ; phthisis, 2. Deaths under five, 3.

*Norwalk*, 20 ; zymotic diseases, 1 ; phthisis, 3 ; pneumonia, 3. Deaths under five, 7.

*Norwich*, 27 ; zymotic diseases, 3 ; phthisis, 4 ; pneumonia, 3. Deaths under five, 6.

*Waterbury* reports for the month of May, deaths, 51 ; from zymotic diseases, 13 ; consumption, 7 ; pneumonia, 4 ; nervous diseases, 5 ; heart disease, 2. Deaths under five, 30.

In public institutions there were 17 deaths in New Haven, 10 in Hartford and 11 in Middletown. Deducting these from the full number reported, gives the following as the annual death-rate for the cities : New Haven, 12 ; Hartford, 13 ; Bridgeport, 12.23 ; Waterbury, 20.4 ; Norwich, 12.9 ; Meriden, 9.8 ; New Britain, 18 ; Norwalk, 15 ; Middletown, 19 ; New London, 14.7.

The ten cities of the State have an estimated population of over 300,000, or about three sevenths of the whole population of Connecticut. The total mortality in the cities in May was 402, as against 469 in April, which is an annual death-rate of 13.1 per 1000.

DELAWARE.—*Wilmington* reports 84 deaths during the month of May in a population of 57,000, of which 27 were under five years of age. Death-rate per 1000, 17.89. From

zymotic diseases there were 6 deaths, and from consumption, 13.

ILLINOIS.—*Rock Island* reports for four weeks ending May 28th, 15 deaths in a population estimated at 13,655, of which 6 were under five years of age. Death-rate per 1000, 14.27. From zymotic diseases there were 6 deaths, and from consumption, 4.

LOUISIANA.—*New Orleans* reports for May 421 deaths in 176,500 white population, and 172 deaths in 66,250 colored population, making the respective death-rates 28.62, and 31.15 per 1000, and 29.31 for the whole population of 242,750. The deaths from zymotic disease numbered 140, including 100 from diarrhœal diseases, and from consumption, 76. There were 284 deaths under five years of age.

MARYLAND.—*Baltimore* reports for four weeks ending May 28th, 495 deaths in a population estimated at 417,220, of which 145 were under five years of age. Death-rate per 1000, 15.42. From zymotic diseases there were 47 deaths, and from consumption, 184.

MASSACHUSETTS.—*Boston* reports 785 deaths during the month of May in a population of 400,000, of which 253 were under five years of age. Death-rate per 1000, 23.5. From zymotic diseases there were 118 deaths, and from consumption, 144.

MICHIGAN.—Reports for the month of May, 1887, compared with the preceding month, indicate that cholera morbus increased, and that pneumonia, influenza, rheumatism, bronchitis, consumption of lungs, and tonsillitis decreased in prevalence. Compared with the average for the month of May in the nine years, 1879-87, intermittent-fever, remittent-fever, consumption of lungs, scarlet-fever, diphtheria, and diarrhœa were less prevalent in May, 1887. Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of May, 1887, at 30 places, scarlet-fever at 32 places, typhoid-fever at 4 places, measles at 50 places. Reports from all sources show diphtheria reported at



5 places more, scarlet-fever at 7 places less, typhoid-fever at 4 places less, measles at 14 places more in the month of May, 1887, than in the preceding month.

Compared with the preceding month, the temperature in the month of May was much higher, the absolute humidity was much more, the relative humidity was about the same, the day and the night ozone were more.

For the month of May, 1887, compared with the average of corresponding months for the nine years, 1879-87, the temperature was higher, the absolute humidity, the relative humidity, and the day ozone were more, and the night ozone was less.

At the meeting of the State Board of Health, April 13th, 1887, Dr. Vaughan made a report on tyrotoxicon, which is the poison which he has found in poison cheese, milk, ice-cream, and oysters, and

Rules for the Prevention of the Development of Tyrotoxicon in Milk were adopted as follows :

1. The cows should be healthy, and the milk of any animal which seems indisposed should not be mixed with that from the perfectly healthy animals.

2. Cows must not be fed upon swill, or the refuse of breweries, or glucose factories, or any other fermented food.

3. Cows must not be allowed to drink stagnant water, but must have free access to pure, fresh water.

4. Cows must not be heated or worried before being milked.

5. The pasture must be free from noxious weeds, and the barn and yard must be kept clean.

6. The udders should be washed, if at all dirty, before the milking.

7. The milk must be at once thoroughly cooled. This is best done by placing the milk-can in a tank of cold spring water or ice-water, the water being of the same depth as the milk in the can. It would be well if the water in the tank could be kept flowing ; indeed, this will be necessary unless ice-water is used. The tank should be thoroughly cleaned every day to prevent bad odors. The can should remain uncovered during the cooling, and the milk should be gently stirred. The temperature should be reduced to 60° F. within an hour. The can should remain in the cold water until ready for delivery.

8. In summer, when ready for delivery, the top should be placed on the can and a cloth wet in cold water should be

spread over the can, or refrigerator cans may be used. At no season should the milk be frozen ; but no buyer should receive milk which has a temperature higher than 65° F.

9. After the milk has been received by the consumer, it should be kept in a perfectly clean place, free from dust, at a temperature not exceeding 60° F. Milk should not be allowed to stand uncovered, even for a short time, in sleeping or living rooms. In many of the better houses in the country and villages, and occasionally in the cities, the drain from the refrigerator leads into a cesspool or kitchen drain. This is highly dangerous ; there should be no connection between the refrigerator and any receptacle of filth.

10. The only vessels in which milk should be kept are tin, glass or porcelain. After using the vessel, it should be scalded, and then, if possible, exposed to the air.

*Detroit* reports 249 deaths during the month of May, in a population of 180,000, of which 53 were under five years of age. Death-rate per 1000, 16.28. From zymotic diseases there were 43 deaths, and from consumption, 31.

MINNESOTA *Bulletin* for May reports, infectious diseases : diphtheria, 60 cases, 12 deaths ; scarlatina, 13 cases, 1 death. Diseases of animals : Glanders, remaining on hand isolated or not accounted for at first of month, 16 ; reported during the month, 29 ; killed, 13 ; released, 2. Remaining, June 1st, isolated or not accounted for, 30.

*St. Paul* reports 139 deaths during the month of May, in a population of 125,000, of which 73 were under five years of age. Death-rate per 1000, 12.48. From zymotic diseases there were 30 deaths, and from consumption, 14.

*Minneapolis*—no report.

MISSOURI.—*St. Louis* reports 563 deaths during the month of May, in a population of 420,000, of which 196 were under five years of age. Death-rate per 1000, 16.08. From zymotic diseases there were 111 deaths, and from consumption, 70.

NEW JERSEY.—*Hudson County* reports 457 deaths during the month of May, in a population of 258,434, of which 177 were under five years of age. From zymotic diseases there were 52 deaths, and from consumption, 71. Death-rate per 1000, 21.0.

*Newark* reports for the month of May 337 deaths in a population estimated at 162,835, of which . . . were under five

years of age. From zymotic diseases there were 34 deaths, and from consumption, 47. Death-rate per 1000, 24.8.

NEW YORK.—*Report of William M. Smith, M.D.*, Health Officer of the Port of New York, March 5th, 1887, is a document of much importance not only to the Port and State of New York, but to the whole country. It is a very clear showing of the quarantine exactions of the port, the extent to which they have been applied during the year, and with creditable results, notwithstanding the misrepresentations and consequent obstacles to which the Health Officer has been subjected by an unprincipled clique of rag importers, in their effort to escape quarantine restrictions on dangerous fomites.

Five thousand nine hundred and seventy-seven vessels from foreign ports bringing 300,918 steerage passengers, were inspected during the year, of whom 43,546 were vaccinated. The number of cases of sickness was 310; of infectious diseases, 117; deaths, 199; deaths from infectious diseases, 13; deaths from accidental causes, 36; births during the voyage, 77.

The number of cases of small-pox removed at quarantine during the year was 23, from 18 steamers. Special stress is laid upon the fact that, while persons particularly interested in the importation of merchandise liable to spread small-pox, and superficial observers generally, of the relative danger of introducing it, as compared with the danger of introducing other diseases, the contagium of this disease is equally subtle with that of cholera or any other infectious disease, more tenacious in its vitality, and, taken one year with another, annually counts many more victims than either yellow-fever or cholera. "There is reason to believe that the contagion of this disease has been often distributed among the people in this country by wearing apparel, baggage, and baled rags."

Moreover, "It requires but little reflection or observation to convince any person familiar with the statistics of immigration, and of disease on passenger steamers, that diphtheria, scarlatina, and measles, which constantly prevail in both city and country, are often reinforced by the contagion that is brought by immigrants.

"The number and fatality of the diseases mentioned may be better appreciated by the report of the Chief of the Division

of Contagious Disease and of Vital Statistics of New York City for the year past (1886): Diphtheria, 3757 cases, 1727 deaths; scarlatina, 1696 cases, 371 deaths; measles, 5028 cases, 668 deaths."

Of the means of disinfection, steam, sulphurous-acid fumes, and bichloride of mercury in solution have been freely used, according to circumstances and conditions, and with unexceptional effect.

*Dr. Joseph D. Bryant*, the new Health Commissioner of New York City, appointed to succeed the late Dr. Woolsey Johnson, deceased, is a native of Wisconsin, but has spent well-nigh the whole of his professional life in New York, where he graduated at the Bellevue Hospital Medical College, February 29th, 1868. He was an intern of the Bellevue Hospital from 1869 to 1871, and immediately thereafter settled in New York, where he soon became an active member of the local medical societies, a busy practitioner, and contributor to professional progress. He was appointed a Sanitary Inspector in the Health Department in 1873, which position he held for six years, and resigned to accept the professorship of surgery in the Bellevue Hospital Medical College, which he still holds. He is also Surgeon-General on Governor Hill's staff. His new appointment is alike creditable to himself and to Mayor Hewitt, and it is doubtful whether any one of the numerous aspirants for the position would have given more satisfaction to the medical profession or better promise for the efficient exercise of the duties of the office. It is already reported to the credit of the new Commissioner that unusual care has been taken in the selection and instruction of the special corps of inspectors for midsummer work, the inspection of tenement houses in *search* of the sick and causes promotive of sickness. THE SANITARIAN has before taken occasion to remark upon this special service as the most useful work of the Department, and shown that it has had a life-saving value of about seven hundred lives for every six weeks it has been employed. With rare exceptions it has been the *only* work of the Department which has anticipated the results of unsanitary conditions, it being the common practice of the health service in New York, as, indeed, in most other places, to await results—in death—ere search is made for the causes. Nothing better illustrates



this practice than the limitations of the plumbing laws and the inspection of plumbing. Notoriously, more than nine tenths of the plumbing in New York is in a condition to be the indirect cause of sickness, yet for it to be reported upon and repaired in any case, before it has caused sickness and, perhaps, death, is not recognized as a duty. The laws are applied to all plumbing "on and after this date," etc., and the scrupulously literal health service is—it is not *called upon* to examine plumbing or anything else until it is *reported to be* in a dangerous condition ; hence, defects are continuously awaiting their legitimate results ; some one is taken with or dies of typhoid-fever or diphtheria, and an inspector is *then sent* to discover the cause. There is also a wide field of inquiry in New York, scarcely at all cultivated hitherto, into the prevalence of special diseases and their relation to local conditions, occupations and nationalities. Public institutions of all kinds, including the school-houses, are, for the most part, left without any sanitary service, except, as in the example given, some fatal result of the neglect is reported. There is, in short, so much room for improvement—for *pioneer* work in seeking out and removing the causes of disease without waiting for and *before* fatal results, that there is no need of particular specifications.

*The State Board of Health Bulletin* reports the total mortality of 122 cities and towns, comprising 3,668,641 inhabitants, for the month of May, 7528 ; of which 32.6 per cent were of persons under the age of five years. From zymotic diseases there were 1157 deaths, a ratio of 153.65 per 1000 total mortality. From diarrhœal diseases, the ratio per 1000 deaths is 18.25 ; from typhoid-fever, 5.00 ; from croup and diphtheria, 71.70. *Small-pox* in New York, 26 deaths ; Brooklyn, 1—12 in Kings County Hospital ; 1 each in Long Island City, Newtown, and Jamaica. No additional cases are reported from New Rochelle or Sing Sing ; 1 case reported in Westchester. From consumption the ratio of mortality is 139.70, and 210.00 per 1000 above the age of five years. The combined death-ratio per 1000 from zymotic diseases, consumption, and puerperal diseases, is 302.78. From acute respiratory diseases there were 145.80 deaths per 1000 total mortality.

*New York City*, 1,481,920 : Deaths for the month, 3192 ; under five years, 1245 ; of zymotic diseases, per 1000, from all

causes, 187.50. By croup and diphtheria, 323 ; typhoid-fever, 11 ; measles, 33 ; malarial diseases, 22 ; whooping-cough, 12 ; small-pox, 26 ; consumption, 437 ; acute respiratory diseases, 549. Death-rate, 25.39.

*Brooklyn*, 690,000 : Deaths, 1256 ; under five years, 480 ; of zymotic diseases, per 1000, from all causes, 171.85. By croup and diphtheria, 109 ; typhoid-fever, 8 ; malarial diseases, 20 ; whooping-cough, 2 ; scarlet-fever, 25 ; measles, 20 ; small-pox, 19 cases, 9 deaths ; consumption, 174 ; acute respiratory diseases, 217. Death-rate, 19.85. It is gratifying to observe that the Department of Health of Brooklyn has also been prompt in the application of the Emergency Fund to the employment of a special summer corps of inspectors, to seek sickness among the tenement houses and other places where it commonly has an abiding-place due to preventable causes. All that is said above with reference to New York, and particularly in regard to the criminal condition of the plumbing in old houses, is equally applicable to Brooklyn ; and here, too, is an uncultivated, though evidently fruitful field for inquiry among the operatives in numerous factories, not omitting the cellars and garrets of the dry-goods palaces, and many places less significant in outside show, where invalids are manufactured at villainously low prices, and where sunlight never enters.

*Buffalo*, 202,000 : Deaths for four weeks, ending May 28th, 303 ; under five years of age, 100 ; from zymotic diseases, per 1000, from all causes, 133.00 ; croup and diphtheria, 15 ; consumption, 49 ; acute respiratory diseases, 34. Death-rate, 19.40.

*Rochester*, 110,000, month of May : Deaths, 154 ; under five years, 57 ; of zymotic diseases, per 1000, from all causes, 181.81. By croup and diphtheria, 9 ; consumption, 18 ; acute respiratory diseases, 25. Death-rate, 16.00.

Unmindful of the health of other people, the city authorities of Rochester recently constructed an open sewer across lands situated within the adjoining town of Brighton, and thereby created a nuisance. The town Board of Health of Brighton thereupon issued an order prohibiting the use of the said sewer, but having no power to go within the limits of the city to execute the order, the Town Board of Brighton was

under the necessity of appealing to the court for an injunction against its big brother, restraining the discharge of sewage into the open ditch for conveyance to and within the boundaries of Brighton. The court granted the injunction, and upon ultimate appeal to the Court of Appeals, the action of the lower court was confirmed, the injunction made permanent, and the city of Rochester consequently compelled to find other means of disposing of its sewage than bestowing it upon a neighbor. Other communities should profit by this eminently just decision of the courts.

**NORTH CAROLINA.**—Monthly bulletin for May reports from 47 counties; measles prevailed more or less in 19, and in a few it was malignant and fatal. Whooping-cough in 19 counties; diphtheria in one; scarlet-fever in one, and typhoid-fever in three. Diarrhœal diseases are reported in 28 counties, and a number of cases of fatal dysentery and "bloody flux." Hog-cholera and chicken-cholera continue in two or three counties, but less than in April. County public buildings in general in good condition.

Vital statistics for the chief cities during the month as follows:

*Wilmington*: population—whites, 9900; colored, 13,500—23,400. Death-rates: white, 8.5; colored, 20.4: 15.4.

*Charlotte*: population—white, 6000; colored, 5000—11,000. Death-rates: white, 32; colored, 36: 33.0.

*Asheville*: population—white, 5625; colored, 1875—7500. Death-rates: white, 18.1; colored, 27.6: 21.5.

*Durham*: population—white, 3500; colored, 2500—6000. Death-rates: white, 13.7; colored, 19.2: 16.5.

*New Berne*: population—white, 2413; colored, 5929—8342. Death-rates: white, 24.9; colored, 39.3: 34.5.

*Fayetteville*: population—white, 2500; colored, 1800—4300. Death-rates: white, 9.6; colored, 21.1: 16.8.

*Raleigh*: no report.

**OHIO.**—Weekly health bulletin for five weeks ending June 10th reports cases of measles, 695; diphtheria, 101; scarlet-fever, 67; whooping-cough, 178; typhoid-fever, 20; typhomalarial-fever, 32. Compared with the preceding five weeks,



measles decreased 512 cases, scarlet-fever, 20 ; diphtheria, 16 ; typhoid-fever, 7, and typho-malarial-fever 25 cases ; whooping-cough increased 80 cases. A second case of small-pox, contracted from the cases at Farmersville, appeared at Ansonia, Darke County. No other cases followed.

The State Board of Health met in regular session at Toledo, June 15th. Dr. John D. Jones, of Cincinnati, was elected president for the ensuing year, to take his seat at the annual meeting of the Board in September.

*Cincinnati* reports 409 deaths during the month of May, in a population of 325,000, of which 139 were under five years of age. From zymotic diseases there were 75 deaths, and from consumption, 72. Death-rate per 1000, 15.10.

*Cleveland* reports 445 deaths during the month of May, in a population of 210,000, of which 128 were of children under five years of age. Fifty-three were caused by zymotic diseases ; measles, 16 ; diphtheria and croup, 12 ; and from consumption, 37. Death-rate per 1000 of population, 16.91.

*Toledo* reports 69 deaths during the month of May, in a population of 73,000, of which 23 were under five years of age. From zymotic diseases there were 9 deaths, and from consumption, 11. Death-rate per 1000, 11.34.

*Dayton* reports for the month of May, in a population of 49,000 : deaths, 48 ; under five years of age, 9 ; from zymotic diseases, 1 ; and from consumption, 11. Death-rate, 10.08.

*The Care and Management of Infants and Young Children* is the subject of an excellent circular recently issued by the Ohio State Board of Health, which cannot be too widely distributed, particularly in the city populations of the State. It urges especially more attention to household surroundings, cleanliness in every particular, the importance of early vaccination, greater care for the prevention of infectious diseases generally, the danger of infected clothing, pure food and proper feeding, special care during hot weather, etc., etc., of use to all who have the care of children, and all should have it ; copies can be obtained free of cost by application to Dr. C. O. Probst, Secretary Ohio State Board of Health, Columbus.

PENNSYLVANIA.—Recent appointments to the State Board of Health by Governor Beaver, as follows : Howard Murphy,



C. E., of Philadelphia, to succeed Rudolph Hering, C. E., resigned to take charge of the Water Department of Chicago ; J. H. McClelland, M.D., of Pittsburg, reappointed. Both these appointments are for the term of six years.

*Philadelphia* reports for four weeks ending May 28th, 1631 deaths in a population estimated at 993,801, of which 703 were under five years of age. From zymotic diseases there were 236 deaths, and from consumption, 229. Death-rate per 1000, 21.32.

*Pittsburg* reports for four weeks ending May 28th, 301 deaths in a population estimated at 210,000, of which 117 were under five years of age. From zymotic diseases there were 42 deaths, and from consumption, 35. Death-rate per 1000, 18.75.

RHODE ISLAND.—*Providence* reports 208 deaths during the month of May, in a population of 121,500, of which 70 were under five years of age. From zymotic diseases there were 50 deaths, and from consumption, 28. Death-rate per 1000, 20.54.

TENNESSEE *Bulletin* reports : " The principal diseases named in the order of their greater prevalence in the State, for May, were, dysentery, malarial-fever, diarrhœa, lung diseases—acute, consumption, cholera morbus, typhoid-fever, and cholera infantum." Measles are reported in 23 counties ; whooping-cough in 13 : mumps in 2 ; roseola in 5 ; scarlet-fever in 2 ; diphtheria and croup in 3, and meningitis in 3.

In the chief cities the respective death-rates for the month, per 1000 of population, annually, are reported as follows :

Chattanooga, white,	16.20	;	colored,	45.60	:	26.00
Clarksville,	16.80	;	"	32.00	:	22.50
Columbia,	15.05	;	"	19.36	:	16.93
Knoxville,	26.69	;	"	39.18	:	29.49
Memphis,	14.02	;	"	28.77	:	19.25
Nashville,	12.80	;	"	21.10	:	15.80

The mean temperature for the month was 70°, slightly above the average of the five years past. The highest temperature was 93°, recorded on the 9th, and was 1° below the maximum for May in 1885, which was the highest for the cor-

responding period in five years. The lowest temperature was  $44^{\circ}$ , recorded on the 28th, and was the highest minimum for May in the five years, the next highest being  $39^{\circ}$  in 1884. The monthly range of temperature was the least for the period above mentioned.

VIRGINIA.—*Richmond* reports for the month of May, 162 deaths in a population estimated at 100,000, of which 80 were under five years of age. From zymotic diseases there were 22 deaths, and from consumption, 17. Death-rate per 1000, 19.44.

WISCONSIN.—*Milwaukee* reports for the month of May, 249 deaths in a population estimated at 180,000, of which 63 were under five years of age. From zymotic diseases there were 33 deaths, and from consumption, 26. Death-rate per 1000, 16.6.

A NEW BULLETIN.—*Monthly Bulletin of Iowa State Board of Health*, June 15th, 1887, Vol. I., No. 1, begins with a summary of disease and mortality statistics of the chief cities of the State in conjunction with other cities in the United States, and the larger foreign cities for irregular periods—some for one week, others for one month, and others still for one quarter, giving the most recently reported death-rates, but it is difficult to give such an abstract from these as will show the relative death-rate of the cities of Iowa with other cities, or the relative prevalence of preventable diseases. The object of the *Bulletin* is stated to be “to give local boards and the public such timely information regarding the public health as may be of interest, and which now only reaches them in the biennial report of the Board,” in which it differs from other State Board bulletins whose primary object, at least, is to summarize the state of the public health and the conditions affecting it, in their respective fields of labor; and this, considering the general exchange of publications among all the State and local boards of health, appears to THE SANITARIAN to be the chief and legitimate object of such bulletins. And, in this regard, we avail ourselves of the occasion to commend the *Bulletin* of the Tennessee State Board, especially, as the one which above all others comprehends the scope and substance of most practical use to the State boards severally.

YELLOW-FEVER AT KEY WEST, according to the latest official report (July 14th), by Surgeon-General Hamilton, at the time of this writing, was still increasing. There had been 110 cases and 30 deaths. A temporary refuge station was at last in process of "being established by the Marine Hospital Service at Egmont Key, where ten days' detention will be required; also disinfection of baggage." This is presumably with reference to persons departing from Key West. But every additional day's continuance of yellow-fever at Key West adds to the danger of its being conveyed to other congenial places, for all previous experience teaches that the precautions taken by the local authorities under such circumstances are never so complete as to wholly prevent the escape of some persons, who do not hesitate to take with them dangerous fomites; that, indeed, nothing short of stamping out the existence of yellow-fever in Key West, at the earliest practical time will relieve other Southern cities from danger, even with the utmost degree of vigilance.

In Havana, too, the disease is on the increase—82 deaths from it during the three weeks ending June 23d—and, consequently, menacing our seaports by means of commerce; and at Guayaquil, also, 8 deaths reported for the week ending June 5th. It is gratifying to observe, however, that the preventive measures practised at New Orleans, the place ordinarily regarded as in the most danger, are of a character to inspire the utmost confidence by all concerned, except the Health Officer of Texas, who insists that the period of five days' detention of persons at the New Orleans Quarantine, who may have been exposed to the disease, is not long enough. He has undertaken to sustain his opinion by citations from various writers on the incubating period of the disease, but he has utterly failed to sustain his opinion by any recorded instance of the disease having been communicated to any community by either persons or things, who or which have been subjected to such prompt and efficient measures as those now in vogue under the direction of the President of the Board of Health of Louisiana, at New Orleans. And we may be permitted to state that, with some knowledge of the relations of Texas to the boundaries and coast traders of Mexico, her danger from that source is infinitely greater than by way\*

of New Orleans. Moreover, of the seaports of Georgia, the Carolinas and Virginia, the excellent service at the Mississippi is no protection to them. The by-ways of avoiding the Mississippi Quarantine by unprincipled traders with Havana, are always a source of danger to our Southern seaports at seasons of unusual prevalence of yellow-fever, and the terrible lessons of the past should not be forgotten in the face of the present attitude of yellow-fever.

SMALL-POX continues to be extensively prevalent in foreign cities, while it is surprisingly tenacious (as above reported) in New York and Brooklyn. Deaths reported from it abroad at the most recent dates are as follows : During the four weeks ending June 25th, in Paris, 45 ; Havre, 10. Three weeks ending June 4th, Trieste, 16. Four weeks ending June 4th, Warsaw, 55. Three weeks ending June 23d, Havana, 27. Week ending June 11th, Birmingham, 1 ; Sheffield, 2. Four weeks ending June 5th, Guayaquil, 10. Week ending June 4th, Amsterdam, 2. Week ending May 21st, Vienna, 2 ; Prague, 5 ; Palermo, 1 ; Pesth, 4. Week ending May 14th, Lisbon, 5 ; Debreczin, 2 ; Fayal, reported. Week ending May 15th, St. Vincent, 1. Week ending May 12th, Alexandria, 2 ; Cairo, 1. Week ending May 7th, Rome 3. Two weeks ending May 15th, Nice, 6. Week ending May 3d, Bombay, 2. Week ending May 28th, Genoa, 4. April 21st-30th, Turin, 8. Month of May, Kingston, Jamaica, 6 ; Nantes, 3 ; Marseilles, 1. Month of April, Marseilles, 14 ; Bordeaux, 1 ; Saragossa, 6. Month of March, Bologna, 13 ; Florence, 10 ; Buenos Ayres, 17.

CHOLERA still lingers in Buenos Ayres, at latest authentic reports ; deaths reported from it during the month of April, 7 ; March, 23. From Callao, the United States Consul, in his dispatch under date of June 7th, 1887, states that " The Government of Peru has removed the restrictions adopted respecting vessels from Chilian ports during the prevalence of cholera in that republic. Now that official advices have been received announcing the total disappearance of the epidemic in Chili, the ports of Peru are reopened to shipping proceeding from those of Chili after a medical examination has been practised,



and the vessel declared in full pratique. The effects of this measure will be beneficial in the extreme to Callao."

Cholera made its appearance on this continent about the end of October last. Its progress in the countries that have been visited by it has been recorded in *THE SANITARIAN*, taken mostly from the Weekly Abstract of Sanitary Reports received through the State Department, by Surgeon-General Hamilton. It has now well-nigh disappeared, and the question naturally arises, Whence did it come? Why did it begin in Buenos Ayres? What circumstances favored its extension to other localities? And what the influence of climate on its progress and arrest?

Our exchanges from Buenos Ayres, Chili, and Peru give some interesting details which can hardly fail to interest the authorities having charge of ports of entry on both the Atlantic and the Pacific coasts.

Buenos Ayres maintains very intimate commercial relations with the South of Europe, and Italy furnishes by far the greatest number of the emigrants who settle in the Argentine Republic. If this immigration be accepted as the origin of the disease, it may be reasonably asked why Rio de Janeiro, which has a more extensive commercial intercourse with the South of Europe than Buenos Ayres, should thus far have escaped. Did it, as some have maintained, arise from local causes favoring its development in that place and at that time? During the month of October last, gastro-intestinal diseases prevailed to a great extent in Buenos Ayres: gastritis, gastro-enteritis, entero-colitis, dysentery, and cholera morbus. The heat of summer was just beginning, and it should be borne in mind that, in reference to climacteric changes, October there corresponds to April in northern latitudes.

At the end of October two ships arrived in Buenos Ayres from Italy; one of them, the *Orion*, had been disinfected in Montevideo; the other, the *Perseo*, entered the harbor without detention and probably without inspection, because, as is alleged, it had on board a "person of importance."

Most of the vessels arriving from foreign ports are moored in what is called the "Boca del Riachuelo," which is situated a few miles south of the city. The sanitary conditions of this

locality are extremely favorable for the planting and development of the germs of cholera. Ponds and marshes are numerous and filthy ; the water of the river is used for all purposes ; the drainage from some of the hospitals is discharged into it and the houses are occupied by sailors and people of the lowest class, who drink it.

October 23d the first official notice was published of the existence of cholera in the city. On the 30th of the same month a German sailor from one of the ships in Riachuelo was sent to the hospital of San Roque, although at the time there was some doubt as to the nature of the disease. About the same time an Italian sailor, who had been sick for a short time, was sent to the hospital from Riachuelo also, and from this time the cases became quite numerous among the ships in the harbor.

The facts are, then, that the authorities, in order to admit a "person of importance" to land without inspecting or disinfecting the vessel, coming from an infected port, probably introduced the disease which found in the locality all the elements for its propagation and were subsequently unable to prevent its extension to the interior ; that it spread rapidly westward, crossing the Andes, and on the 26th of December the first death occurred on the Pacific Slope in a small town at the foot of the mountains. Here up to the 5th of January 114 cases occurred with 64 deaths. In the month of March, which is the beginning of winter, the cold became intense and probably had much to do with checking the progress of the disease in that region. There is still reason to fear that the disease may creep up on the eastern slope of the mountains and visit Bolivia and Peru. It may also be carried north along the Pacific and reach Panama, if not higher latitudes.

Calcutta.—Deaths reported from cholera for the quarter ending March 31st, 376 ; week ending May 2d, 59. Madras, during month of May, 9. From Palermo the United States Consul reports, under date of July 6th, "two sudden deaths ; believed cholera."

Sicily.—By cablegram of July 12th cholera is reported increasing. Two hundred cases with 140 deaths have occurred at Catania, and the Neapolitans are greatly alarmed on account of the arrival in their city of fugitives from Sicily.

## LITERARY NOTICES.

BACTERIOLOGY.—Mr. Watson Cheyne, in the July issue of the *American Journal of the Medical Sciences*, publishes an elaborate and fully illustrated paper on the study of bacteria by means of cultivation, with a full description of the technique. As in the case of all pathogenic organisms, it is necessary for complete proof that they are the cause of a particular disease to show that, on their introduction into an animal of a species susceptible to the disease, they set up the disease in question. And experiments on animals are also required in the case of bacteria, in order to study the mode of infection and many other points in the natural history of the disease. Mr. Cheyne also fully describes the technique of the method of study of bacteria in relation to the living body.

MINERAL SPRINGS OF THE UNITED STATES: Bulletin of the United States Geological Survey, No. 32. Government Print, Washington. This Bulletin of 235 pages, compiled by Albert C. Peale, M.D., unquestionably contains the most complete "Lists and Analyses of the Mineral Springs of the United States" hitherto published, yet it is only "A Preliminary Study." The author found, at the outset of his work, that "In attempting the collection of data for the statement of the commercial value of the mineral waters of the country for publication in the Mineral Resources of the United States, 1883 and 1884, it was necessary as a prerequisite to have a list of the springs from which these waters are derived," and he soon found "that all existing lists were incomplete." This is not surprising by any means, as hitherto there appears to have been no effort to obtain a list of *all* the mineral springs of the United States. The nearest approach to it was the effort, which he recognizes, by a committee of the American Medical Association (Report of Committee on Sanitaria and on Mineral Springs, Vol. XXXI., pp. 537-565, 1880), enumerating about 500 localities. That report was a classified catalogue of mineral waters, based upon such reliable analyses as the committee was at that time able to obtain, without any



pretence at completeness. Bell's (John) "Baths and Mineral Waters," 1831 and 1855; Moorman's "Mineral Springs of North America," 1873; Walton's "Mineral Springs of the United States and Canada," 1883, and Bell's (A. N.) "Climatology and Mineral Waters of the United States," 1885, also referred to by the author, are still less complete, with regard to the number and localities of mineral springs, because the writers were more concerned with those of well-recognized therapeutical value. Yet the work now before us far outstrips all those which have preceded it in the mere enumeration of localities, of which 2822 are given—and still incomplete—but also in the enumeration of those of established value. Over 600 are places of resort, and more than 200 sell the waters to a greater or less extent. The springs are grouped under the States, severally, and tables of analyses of the waters are appended to the lists, so far as they have been obtained. It is an unusually valuable contribution to the subject of which it treats, and to the resources of medical practitioners. But for facility of reference it would have been still more valuable by a classified index—grouping the springs alphabetically according to their chemical characteristics. We would not, however, have it forgotten that this is a preliminary publication of work still in progress under such auspicious facilities as promise a fruitful future.

THE SPEECH OF SEÑOR DON MATIAS ROMERO, Mexican Minister at Washington, on the occasion of the sixty-fifth anniversary of the birth of General U. S. Grant, celebrated at the Metropolitan Methodist-Episcopal Church, Washington, April 25th, 1887, a pamphlet of sixteen pages, is a worthy tribute to General Grant from an interested observer of his military career not only, but of his civil life; and, particularly, of General Grant's interest in Mexico, by one who appears to have watched his career and been in sympathy with him, from the very beginning of his military career in Mexico, in 1846, to the close of his life, and to have thus made use of extraordinary opportunities of acquiring this high appreciation of his character.

A MANUAL OF TREATMENT BY MASSAGE AND METHODICAL MUSCLE EXERCISE. By JOSEPH SCHREIBER, M.D., Member of K. K. Gesellschaft der aerzte of Vienna, Foreign Member



of the Société Française d'Hygiène, etc., etc. Translated, with the author's permission, by Walter Mendelson, M.D. 8vo, pp. 285. Illustrated. Philadelphia: Lea Bros. & Co. This book truly supplies a "long-felt want." In default of such a work in English, massage has been well-nigh so exclusively under the direction, as well as the practice, of charlatans that many physicians have neglected to avail themselves of its benefits. But there have been a few prominent exceptions by practitioners with a thorough knowledge of anatomy, physiology, and pathology, which, for direction at least, is as essential for the proper application of this treatment as of any other. Few physicians of much practical experience who cannot call to mind sad results of "health lift" and other means of using mechano-therapy under the direction of persons without any practical knowledge essential for the successful practice of massage in any of its details. The work before us is based upon essential knowledge, and the practice described and illustrated is intended for application by physicians themselves, or at least to be applied under their special direction and oversight with the same care as in the administration of medicine or the dressing of a wound. In so far it is a systematic treatise describing the physiological effects of massage, the different kinds of apparatus, the manipulations, mechanical movements, and the diseases to which it is suited.

SURGERY OF THE PANCREAS, as based upon Experiments and Clinical Researches, by N. SENN, M.D., of Milwaukee, Attending Surgeon to the Milwaukee Hospital, Professor of the Principles and Practice of Surgery, etc., an abstract of 129 pages from the Transactions of the American Surgical Association for 1886, which throws much light on the subject of which it treats, of interest to all medical practitioners.

FEEDING PATIENTS AGAINST THE APPETITE. By EPHRAIM CUTTER, M.D., M.M.S., New York, is a pamphlet of forty-eight pages, urging the importance of forcing food in certain cases of disease, fortified by numerous citations showing the life-saving effects. Some rather remarkable cases are cited in evidence of the *food* value of alcohol, which scarcely leave room for doubt, notwithstanding the weight of opinion to the contrary, by writers who have had no such cases. Needful dis-

crimination is dwelt upon with regard to the kind of food required, and, altogether, a good deal of practical information elucidated.

BAKED BEANS: A Serio-Humorous Medical Paper, by EPHRAIM CUTTER, A.M., M.D. A pamphlet of twenty pages reprinted from the *Albany Medical Annals*. The author of this paper appends as a subhead "*Ethics, Chemics, Physiologies, Morphologies, Pathologies and Culinary Ethics*." But it is plain that this was an afterthought, lest he, being to the manor born and having enjoyed the privilege of revelling in the intellectual food of the "Hub" all his days hitherto, should appear, after all, not to know beans in every particular. And had he thought of any other word sufficiently comprehensive to include the totality of knowledge of beans, we have no doubt whatever he would have fortified himself still more completely by the use of it. But of all the qualities considered, "Culinary Ethics" are considered the most important. Beans are not regarded as among the most digestible food, even under the most favorable circumstances; and without proper cooking, Dr. Cutter thinks the most rational way of partaking of them is to feed them to animals whose organs are better adapted to digest them than man's, and, if need be, let man eat the animals. In this opinion we fully concur, but we do not think beans are exceptional in this regard. The same may be said of hog, hominy, and oats, and many other varieties of food for *disease* unless properly cooked. And to all the same query may be put:

"Why should we go through life with our intestines waging an unequal warfare with any food—baked beans, for example—simply because we are too ignorant or inactive to demand that they shall be cooked after a process like the following?

"1. Soak a quart of beans over night in two quarts of cold water.

"2. In the morning turn off the water, add fresh water, and boil them till the membranes begin to separate; turn off the water.

"3. Put the beans in a baking pot, with half a pound of salt pork buried in the beans, add two tablespoonfuls of molasses, and cover the whole with water. Bake in a slow oven all day; a baker's oven is best. Watch the beans, and if they become too dry add more water. When thoroughly cooked it will be

known by the softness of the beans in the mouth between the teeth, by the taste, and by the microscope showing the starch grains broken up and mixed in one homogeneous mass that will not polarize light with a selenite plate.

“4. Take time to eat and chew thoroughly.

“5. After eating, go out in the open air and walk or work. Do not go to church right after eating baked beans ; they will stay in the stomach, and their indigestion will do much toward spoiling the enjoyment of the exercises there. Dyspepsia and religion do not go together well, but good digestion and holiness are twins. Holiness, health, whole and hale, come from the same root. A holy man is a healthy, whole man, with all the functions in good order and no dyspepsia. Dyspepsia is a physiological sin.”

PAPERS IN PENOLOGY : A pamphlet of 112 pages, comprising : “A Study of Prison Management” and “Education as a Factor in Prison Life,” by Charles Dudley Warner ; “Moral Education in Prisons,” by Charles A. Collin ; “Report on Labor in Prisons and Reformatories,” “Literary Culture in the Reformatory,” “Governmental Organization,” “Synopsis of Rules and Regulations,” and “Summary of Daily Routine,” with a chart showing average progress toward parole of four groups of men, etc., from the *Reformatory Press*, Elmira, N.Y., should be read by all persons interested in the care of wayward youth. And as a companion pamphlet,

GIRLS' REFORMATORIES : Reasons for establishing a separate girls' reformatory, instead of rebuilding on the old site the edifice recently destroyed by fire at the State Industrial School, formerly the Western House of Refuge, Rochester, N. Y., embodied in a letter addressed to the Hon. James W. Husted, Speaker of the Assembly, by William P. Letchworth, Commissioner of the State Board of Charities, Eighth Judicial District, New York. It is sincerely to be hoped that the excellent plans for the construction and management of an establishment for this purpose, suggested by Mr. Letchworth, may be speedily carried into effect, as a most important means of child-saving work.

DR. T. H. DARBY, of Morrow, O., is doing an excellent work in urging through the public press more attention to the proper care of the health of convicts in the State prisons. It



is unfortunate that persons in charge of those institutions, not by any means limited to Ohio, appear to regard the deprivation of cleanliness, light, and air as part of the punishment, than which, surely, nothing could be farther from the intent of the State, or in itself more deserving of punishment. And we sincerely hope that the doctor will persevere in his exposure of such treatment till its perpetrators are made to change places with their victims.

DR. DANIEL G. BRINTON, who has been for a number of years editor and publisher of the *Medical and Surgical Reporter* and the *Quarterly Compendium of Medical Science* severed his connection with those journals on the 1st of May inst. It is not his intention, however, to retire from the arena of medical journalism; on the contrary, he hopes in the early autumn to announce his connection with a journal which will fully meet the legitimate demands of the medical public of the day.

107 YEARS OLD. AN EVENTFUL BUSINESS CAREER.—Not many houses in any line of business in this country can show a business career extending over a century. The drug firm of Hazard, Hazard & Co. is one of half a dozen notable examples in this city. Its business was established in 1780, and since 1821 members of the Hazard family have been prominent in its management. The firm's name has just been changed from Caswell, Hazard & Co., but the partners and management remain the same as for years past. The business career of the firm has been marked by integrity in the treatment of customers, and consequent prosperity. They have two places of business in this city, one at the corner of Fifth Avenue and Twenty-fourth Street, and the other at the corner of Sixth Avenue and Thirty-ninth Street. At both places a system of checks and revision is in vogue in the compounding of prescriptions, by which there is as nearly absolute protection from error as human ingenuity can devise. The special preparations of the firm in medicine and toilet articles, as well as their line of surgical instruments, are known all over the country. The high character of the house has been attained by the strictest attention to business and by merit.—*New York Tribune*, April 16.



## PUBLICATIONS—REPORTS, REPRINTS, ETC., RECEIVED.

*Persistent Pain after Abdominal Section*, by James B. Hunter, M.D., New York.

*Report of Willis G. Tucker, M.D., Ph.D., Analyst of Drugs*, Albany, N. Y.

*Inter-State Notification: Its Principles as Demonstrated in the History of Yellow-fever at Biloxi, Harrison County, Miss., 1846.* Joseph Holt, M.D., President of the State Board of Health of Louisiana, New Orleans.

*Quarantine and Public Health: Annual report of Grosse Isle Quarantine Station, St. Lawrence River*, by F. Montizambert, M.D., Medical Superintendent.

*Bulletin of the Chemical Society of Washington.* Nos. I. and II.

*Dietetics in Idiopathic Fevers*, by Joseph Herrick, M.D., Cleveland, O.

*Hog Cholera Critically Considered*, by Frank S. Billings, Lincoln, Neb.

*Method in Medical Study*, by Charles H. May, M.D., New York.

*Follicular Amydalitis*, by A. Jacobi, New York.

*Surgical Notes from the Case-Book of a General Practitioner*, by William C. Wile, M.D., Philadelphia.

*Removal of the Uterine Appendages*, by Mary A. Dixon Jones, M.D., Brooklyn, N. Y.

*Antisepsis in Ovariectomy and Batty's Operation*, by Robert Batty, M.D., Rome, Ga.

*Manhattan Eye and Ear Hospital Report*, New York.

*Subglottic Laryngeal Growths*, Novel Procedure for the Removal of, by William Chapman Jarvis, M.D., New York.

*Rest for Painful Eyes.* Is this Advice always Good? by Julian J. Chisolm, M.D., Baltimore, Md.

*Aiken and Thomasville*, as Types of Inland Health Resorts of South Carolina and Georgia, by W. H. Geddings, M.D., Aiken, S. C.

*Medical and Library Association*, President's Address, by C. J. Lundy, M.D., Detroit, Mich.

*Rhinology in the Past and in the Future*, by C. H. Von Klein, M.D., Dayton, O.

*Monographia Syphilitica*, Illustrated, by George W. McDade, M.D., Montgomery, Ala.

*Relative Influence of Maternal and Wet-Nursing on Mother and Child*, by Joseph Edcil Winters, M.D., New York.

*Laryngology and its Cognate Branches in America, and the Simplest and most Efficient Treatment of Diphtheria*, by W. H. Daly, M.D., Pittsburg, Pa.

*Operations on the Drum-Head for Impaired Hearing*, by Seth S. Bishop, M.D., Chicago, Ill.

*Pennsylvania Hospital*, Report of Board of Managers, Philadelphia.

*Poisoning from the Eating of Dried Beef*, by R. Harvey Reed, M.D., Mansfield, O.

*Diagnostic Areas Over the Human Chest*, by J. R. Leaming, M.D., New York.

*Cincinnati Hospital Annual Report*, 1886, H. M. Jones, Superintendent, Cincinnati, O.

*Contributions to the Diagnosis of Yellow-Fever*, by Augustus M. Fernandez, M.D., New Orleans, La.

*College of William and Mary*: Contribution to the History of Higher Education, with Suggestions for its National Promotion, by Herbert B. Adams, Ph.D., Bureau of Education, Washington, D. C.

*Laws of New Jersey Relating to Food and Drugs*, William K. Newton, M.D., Commissioner.

*Treatment of Sero-Fibrinous Pleurisy*, by Benjamin F. Westbrook, M.D., Brooklyn, N. Y.

*Medical Education*. Oration delivered before the Alumni Association of the Medico-Chirurgical College of Philadelphia, April 7th, 1887, by Dudley S. Reynolds, A.M., M.D., Louisville, Ky.

*Certain Cases of Sterility in the Female, and their Treatment*, by Edward H. Grandin, M.D., New York.

*Seventh Inaugural Address of Clark Bell, Esq.*, President of the Medico-Legal Society of New York.

*Mental Epilepsy*, by L. W. Baker, M.D., Baldwinville, Mass.

*New Treatment of the Affections of the Respiratory Organs by Rectal Injections of Gases, after the Method of Dr. Bergeon*, by Dr. V. Morel. Philadelphia: James W. Queen & Co.

# THE SANITARIAN.

AUGUST, 1887.

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## THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

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(Concluded from page 549, Vol. XVIII.)

DR. A. Y. P. GARNETT, of Washington, read a paper on "Observations upon the Sanitary Advantages of Tide-Water, Va., including Virginia Beach as a Winter Health Resort." He said in substance that, while no official records of the causes of death in this locality have been kept, the traditions of the inhabitants during the past hundred years, and the observation of intelligent practitioners practising in this region, go to show that consumption is very rare. In other respects this locality is remarkably healthy. The average number of deaths per thousand from all causes during the past six years has been 10.66. The average death-rate in other sections of the State is 12 per 1000. The author was disposed to attribute some of the benefits which this locality presents to the proximity of the Great Dismal Swamp, which has an area of thirty by ten miles, covered with cypress and evergreen trees. At Virginia Beach the forest comes down close to the sea. The atmosphere is remarkably dry and salt, exposure during the day shows no tendency to absorb moisture. The average temperature during the winter months is considerably higher than at other places along the coast. As compared with Atlantic City, we have the following figures :

	Virginia Beach.	Atlantic City.
January, . . . . .	34.6°	30°
February, . . . . .	39°	29°
March, . . . . .	45°	38.2°

The average humidity is also much less than it is at Atlantic City.

Dr. Walter Platt, of Baltimore, remarked that, with reference to the rate of mortality given in the paper, he thought that very little reliance is to be put in the statistics of sparsely-settled districts. It is extremely difficult in these sections to get the citizens to make a proper report of the deaths to the authorities.

Dr. A. L. Loomis, M.D., of New York, read a paper on "Evergreen Forests as a Therapeutic Agent in Pulmonary Phthisis." "It has long been known," he said, "that similar climates as determined by geographical and meteorological conditions have different therapeutic effects. That there is some relation between the development of organisms and atmospheric conditions is becoming more and more apparent. We know that cold and high altitudes render the air aseptic, but the degree of cold and the height required is so great that clinically it is not possible to derive much advantage from this fact. The effect of a purely aseptic air upon ulcerative processes is not so great as the effect of an atmosphere which is aseptic on account of the presence of antiseptic agents. The belief in the good effect of pine forests in cases of phthisis is quite unanimous, and the author thought that the clinical evidence in favor of their beneficial influence in these cases was unquestioned. The atmosphere in such regions is not only aseptic, but also antiseptic. Such an atmosphere contains considerable turpentine vapor, and we should therefore expect it to contain a certain amount of peroxide of hydrogen. It was the speaker's opinion that the majority of cases of phthisis die not directly from the lesions in the lung, but from the secondary septicæmia and pyæmia which is set up. It is impossible to apply to the ulcerations within the lung the antiseptic washing and dressing that is employed in external lesions, but if an antiseptic atmosphere can be obtained we may hope to counteract the secondary poisoning. Such an atmosphere will not destroy the bacilli, but it will accomplish much in the way of arresting the suppurative process." It was his opinion that "the atmosphere in the region of evergreen forests acts in a manner similar to the antiseptic agents which are successfully used to arrest suppurative processes in



other portions of the body, and he thought that in all probability the active agent was the peroxide of hydrogen resulting from the oxidation of the turpentine vapor. While it is not possible for every one suffering with pulmonary phthisis to go to an antiseptic atmosphere, yet it is possible to render the air of any particular locality antiseptic. The evergreen forests should be preserved, and evergreen trees should be planted in the neighborhood of our homes."

Dr. S. S. Cohen, of Philadelphia, said that the paper of Dr. Loomis tends to confirm certain impressions which he had formed from an experience with certain methods of making an artificial climate. He had had excellent results in the way of alleviating symptoms in phthisis by the inhalation of terebinthinate substances, especially where this has been associated with the inhalation of peroxide of hydrogen or oxygen. Under these inhalations he had seen laryngeal ulcers cicatrize, especially if they had been previously washed with the solution of peroxide of hydrogen.

The paper was further discussed by Drs. Bruen, Westbrook, Garnett, and Musser.

Dr. E. L. Trudeau, of Sarenac Lake, read a paper on "Environment in its Relation to the Progress of Bacterial Invasion of Tuberculosis." "Environment," he said, "evidently has an important bearing in reference to bacterial invasion. He proposed to himself the following questions: (1) What results ensue when bacillar invasion and unhygienic conditions are made to co-exist? (2) Are unhygienic surroundings sufficient to cause phthisis when precautions are taken to exclude the bacillus? (3) Is bacterial infection always productive of tuberculosis when the animal is placed under the most favorable hygienic conditions? In order to answer these questions the following experiments were performed: Fifteen healthy rabbits were taken and divided into three sets of five each. The first experiment consisted in taking five of the rabbits, inoculating each with a pure culture of the tubercle bacillus and subjecting them to overcrowding in a dark cellar, with poor and insufficient food and other unhygienic conditions. In the second experiment, five rabbits were placed in a box and lowered into a pit dug in the ground, the mouth of the pit covered with earth with the exception of a trap-door for

the introduction of food, which consisted of one small potato for each animal per day. So damp was the air that the box in which the animals were confined was constantly wet. The third set of animals were inoculated with the tubercle bacillus and turned loose on a small island, where they had abundant sunlight, fresh air and exercise. They were daily supplied with wholesome food.

“The results of these experiments were that four of the first five rabbits died in three months, and extensive tuberculosis found. The fifth animal was killed at the end of five months and the same condition found. The second set of five rabbits were all living at the end of four months. They seemed to be as active as at the time the experiment began. They were then killed and careful examination revealed nothing abnormal. One of the third series of rabbits died at the end of one month, and on examination there was enlargement of the cervical and bronchial glands and tubercles in the spleen. The remaining rabbits continued in apparently good health, and were killed at the end of four months. They were loaded with adipose tissue, the flesh was firm and red, all the organs were normal, and even the seat of the punctures could not be made out. These experiments confirm the view that the production of tuberculosis is a most complex process. Although the environment may bear out the relation of a predisposing cause to the microbe invasion, it is nevertheless a most potent factor in determining the future and the final results of the disease, and while we may not underestimate the pathogenic properties of the bacillus, the effect of environment upon the vitality is a factor which must not be ignored.”

Dr. Walter Platt, of Baltimore, read a paper on the “Climate of St. Moritz, Upper Engadine, Switzerland.” Dr. A. C. Peale, of the United States Geological Survey, Washington, presented “A Classification of American Mineral Waters.”

Dr. F. F. Smith, of St. Augustine, read a paper on “St. Augustine as a Winter Health Resort.” He described the geographical and climatic conditions existing in St. Augustine. An abundance of pure water is obtained from sixty artesian wells. This water is charged with sulphuretted hydrogen. Drinking-water is obtained by means of cisterns. A complete system of sewers is now being introduced. These will be flushed by the waste water from the artesian wells. The aver-

age temperature during the winter months of the past ten years has been as follows : November 63°, December 57°, January 55°, February 58°, March 61°, and April 67°. The average number of rainy days during the winter months for the past ten years has been 33, but on 19 of these occasions the rainfall was at night, so that there were really only 14 rainy days.

The following papers were read by title : " An Invalid's Day in Colorado Springs," by Dr. S. E. Solly, of Colorado Springs ; " The Climate of Southern California," by Dr. H. S. Orms, of Los Angeles, Cal. ; " Pass Christian, Mississippi, as a Health Resort," by Dr. Charles Le Roux, of Pass Christian.

The report of the Committee on the Congress of American Physicians and Surgeons was received and adopted. Dr. A. L. Loomis, of New York (with Dr. F. Donaldson, Sr., of Baltimore, as alternate), was appointed as the representative of the Association to the Committee on the Congress.

The following were elected to membership : Drs. A. L. Gihon, U. S. N. ; W. D. McDougal, San José ; A. C. Peale, U. S. Geological Survey ; E. Wilos Linn, Los Angeles ; F. F. Smith, St. Augustine ; F. P. Henry, J. J. Yerick, and Thomas J. Mays, Philadelphia ; Thomas C. Leatmer, J. Carey Thomas, and Walter Platt, of Baltimore ; S. E. Solly, Colorado ; S. W. Langmaid, Boston ; S. E. Morgan, Washington ; S. H. Chapman, New Haven, and S. A. Fisk, Denver.

Officers for the ensuing year : *President*, Dr. A. L. Loomis, New York ; *Vice-President*, Dr. A. Y. P. Garnett, Washington, and James T. Whittaker, Cincinnati ; *Secretary* and *Treasurer*, Dr. James B. Walker, Philadelphia ; *Council*, Drs. E. T. Bruen, Philadelphia ; J. H. Tyndale, New York ; F. H. Bosworth, New York ; F. C. Shattuck, Boston, and R. G. Curtin, Philadelphia.

The Association then adjourned.

## UNSANITARY CONDITION OF NEWPORT, R. I.

### WHAT IS DUE TO SUMMER RESIDENTS ?

I HAVE read this heading so often in the " season," and waited so long to see a single reference to " a pure water-sup-



ply," that I think it would not be inappropriate to declare that one of the first necessities for any settlement of human beings is a wholesome water-supply—indeed, it must be as nearly *pure* as possible. The water-supply of Newport is certainly of a very inferior quality, and not what one would reasonably expect to find in one of our leading summer resorts. Moreover, it is very expensive, and I believe much more so than in most of our New England towns.

The wells of the city of Newport are found generally *dangerous*, and cases of typhoid-fever are constantly occurring in the city from no other cause than drinking well-water. Old families clinging to their wells, say : *Firstly*. The "Newport" water-works supply is so bad we are afraid to use it. *Secondly*. The water rate is so very expensive we cannot afford it. *Thirdly*. Our wells have for generations held good reputations for excellence and purity. Every one who uses well-water in Newport should cease to do so at once, and have the city water put into their homes. Bad as the city water undoubtedly is—unhealthy as it is, dirty as it is, and dear as it is—it is every way safer and better for use than either well or cistern in this crowded little town of Newport. The cesspools and vaults do double and triple duty, first for the citizens of the town, then for *hordes* of excursionists, and for countless summer residents and invalids ; and this has been going on for many years. What wonder is it that the soil is super-saturated with all uncleannesses and that the wells are constantly accumulating deadly poisons in solution. As the warm weather advances, the dangers from well-water increase. The washings from the roofs into cisterns are also very injurious, containing street dust, including manure and also the droppings of birds. This water, especially in summer, is very unhealthful. Filtering does not remove its unwholesome condition. Old residents say, "These wells have been used for generations by healthy people—they were good enough for our fathers, why not for us?" They ignore the fact that besides the enormous increase of population, permanent and transient, the ground is in a less and less suitable condition for a pure water-supply. Indeed, it is in many cases absolutely foul. The argument of these people reminds one of the guest at a hotel who asked the landlord for a clean roller-towel in the wash-room. The as-



tonished and angry host regarded him for a moment with pity and contempt, and answered, "Why do *you* complain? Five hundred men have wiped their faces and hands on this towel the past two or three days, and *you* are the first to complain. Do *you* consider yourself better than others?" The water-supply of Newport is indeed a serious and constant menace to health, both for ourselves and our little ones, and there is no doubt that its unwholesome reputation has gone abroad, and is preventing many from coming here for the summer. For invalid children and adults the use of the city water is a positive danger. It is not wise to say that "people will come to Newport whether the water is good or not." Water is a most important supply, and pure wholesome water is undoubtedly "due to our summer residents, and to all who live in this beautiful and otherwise healthy town."

I do not make these statements to alarm the community, but to show to those who are making money by supplying such water to the town, that there is a limit to public endurance, and that the people are seriously considering the subject of a pure water-supply.

LOCUM TENENS.

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## SAFETY-LAMPS IN MINING OPERATIONS.

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MR. CHARLES GORDON some time ago read a paper before the North Staffordshire (England) Mining Institute, the subject of which was a consideration of the efficiency and merits of the various lamps employed in the illumination of mining properties. The author said that the mining community was now anxiously expecting the report of the Royal Commission, which would, no doubt, greatly influence and direct the choice of the lamps of the future. It was highly probable that the ordinary Davy and the Clanny would receive their death-blow at the hands of the Commissioners, the former—which had been for many years in high favor and rendered good service—from its insecurity in explosive mixtures, where there were strong currents, and the inducement to smoking which it presented, besides the ease with which a slight blow with a pick or a stone might instantly change it from a useful assistant to

a highly dangerous weapon. The Clanny, which had always been a useful road lamp, was to be condemned from the element of danger arising from a sudden fracture of the glass without extinguishing the flame. The lamp of the immediate future that would probably be recommended by the Commission would be the Williamson, the Protector, or the Belgian Mueseler. The Protector and the Mueseler were formed on somewhat similar lines, while the Williamson might be described as a modification of the Stephenson and the Clanny. It had two glasses, the inner one resembling a Stephenson, and fitted with a copper top or cap. The outer glass resembled that of a Clanny. The method of supplying the Williamson lamp with air was similar to that of a Stephenson, but its great superiority over that lamp was due to the fact that the whole of the air must press through a gauze to feed the flame. It was said that in all its trials this lamp had never been exploded. It further possessed the property of remaining alight when tilted, which lamps of the Mueseler pattern did not. The weights of the lamps were as follows : Protector and Williamson, each 3 lbs. 4 oz. ; Clanny, 2 lbs. 10 oz. ; Stephenson and Mueseler, each 2 lbs. 4 oz. ; Davy, 2 lbs. The weight of a lamp should be studied, and especially of those carried by the firemen and officials appointed to examine the workings. It was only those who had to carry lamps all day that could understand the fatigue it occasioned, and the lighter the lamps were produced, and the more convenient they were to handle, the better prospect was there of having the workings properly examined.

A lamp should not be made so sensitive as to go out at the least shock. In many cases lamps might be suddenly extinguished, and leave the workmen in total ignorance whether the cause was a shock or the pressure of an explosive mixture. With regard to the attempts that had been made to produce an electric lamp for mining purposes, it was obvious to all acquainted with underground workings that nothing but a self-contained lamp would meet the want. All lamps dependent on fixed wires must fail ; since, from the ever-changing condition of mines, they were continually in danger of breakage, thereby causing the severance of the electric current. For permanent roads that stood well, and for stations, the

electric light might, perhaps, be beneficially employed, but when that was the case it was generally safe to use oil lamps. The Hope safety-lamp was a good pattern for stationary purposes. This lamp, while evidently adapted from the railway carriage lamp, possessed other features, such as the gauze over the flame, the improved method of adjusting the wick, the fact that it might be fastened either with a padlock or a lead rivet, and the avoidance of danger from fire. After noticing the various kinds of lamps now in use, and the districts in which they were most in favor, he quoted from a report of experiments made in October last in the Aldwark Main Colliery, showing that the Davy was in each case exploded, while for four hours attempts were made without effect to explode the Mueseler and the Williamson lamps. Having made some remarks on the locking of lamps, he gave details respecting their illuminating power, and made suggestions as to the management of lamp-houses. He next dwelt on the subject of testing lamps, and described a testing apparatus, lent for the occasion by Messrs. Edwards, of Wakefield, who also lent a large collection of lamps, ancient and modern, for the illustration of the paper.

Mr. W. Y. Craig, M.P., agreed with Mr. Gordon that any light that was not self-contained, and that depended upon wires, would not answer in a mine. Of course it would be very much the same in effect as had been experienced in conducting power for working machinery in coal-getting. They had found machines for coal-getting very good ; but inasmuch as they depended upon power conducted in pipes not self-contained, they had not come into general use, and he apprehended that it would be the same with regard to safety-lamps. He obtained a dozen Mueseler lamps a few years ago, and after using them for some time it was found that they were easily extinguished, and that the least movement on one side put out the light. The quality for which they were specially recommended was their sensitiveness in enabling them to detect gas. He tried a Mueseler lamp himself where there was gas, and he did not find it as good as the Davy for detecting gas. On the contrary, he found that he could go farther among the gas with the Mueseler than with the Davy without detecting it. Both the Davy and the Mueseler were tried in



the presence of Mr. Sawyer, the Assistant Inspector of Mines, who testified to the fact that they could go farther with the Mueseler than with the Davy, that they could carry the Mueseler far beyond what the Davy showed to be a dangerous point. He should not say there was anything in the Mueseler lamp which could recommend its more general use than they found in the Clanny. There was no doubt it was as dangerous, as any fracture in the glass rendered it as bad as a naked light. But that was the case with other lamps, and great care was necessary to prevent the glass from being fractured, or the gauze to be damaged by a pick or a stone. The lamp, perhaps, most exempt from this danger was the Stephenson, which was, on the whole, the safest lamp, but it had this disadvantage, that it was heavier, and workmen were not fond of using it. No doubt the subject was one of paramount importance, and it was impossible to discuss it too much or too closely.—*American Gaslight Journal*.

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ACCIDENTS IN MINES.—The annual reports of the Inspectors of Mines to Her Majesty's Secretary of State were issued on Monday. They show that during the year the aggregate number of persons employed in and about the whole of the mines in the United Kingdom of Great Britain and Ireland amounted to 561,092, of whom 5568 were females above ground. The total number of fatal accidents was 869, and the total number of deaths occasioned thereby 1018; being an increase of three in the number of fatal accidents, and a diminution of 196 in the number of lives lost, compared with the totals for the preceding year. The total number of persons employed in and about the mines under the Coal Mines Regulation Act was 519,970, of whom 4131 were females working above ground. There were 807 fatal accidents and 953 deaths, the number of accidents being the same as in the preceding year, but the number of deaths being 197 less. There was one fatal accident for every 644 persons employed, and one death for every 545 persons employed. These figures compare favorably with the corresponding averages for the ten years 1874 to 1883, which were 587 and 446 persons, respectively.—*Engineering Times*.



## THE RELATION OF THE PHYSICIAN TO SANITATION.\*

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By T. CLARKE-MILLER, M.D., of Massillon, O., President of the State Board of Health of Ohio.

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MANY of us, though still young, have witnessed a marvelous development of a most important feature of the many-sided science of health. We have studied with a view to make ourselves proficient in the treatment of disease in its multifarious forms. We have almost fallen into the habit of speaking of our occupation as the "healing art." Volumes and libraries have for years flowed from steam printing-presses devoted to the description and treatment of disease. A science of etiology has comparatively recently grown up, which with its growth has opened up a vast domain, hitherto almost entirely neglected, and which even now does not command the universal attention of our profession as it should : the preservation of health and the prevention of disease, personal hygiene and public sanitation, tersely expressed by the term *sanitary science*.

The study of disease and the oft-recurring failures in its treatment have stimulated thinking men to inquiry as to the surroundings of the sick, climatic influences, the quality of the air, water, and food, and from that to the external conditions of health. It is every day becoming more and more a question with our most thoughtful men how we may *prevent* disease—how we may remove or mitigate the perils that environ health. How brief and spiritless nowadays are the discussions on the treatment of small-pox? How unimportant and stale has the mere therapeutics of this disease become? We have almost forgotten the numberless graves this dire disease used to fill, as well as the scarred and seamed faces of the multitudes on whom it laid its hideous mark. Since Jenner, starting with a fragile thread of unlearned tradition, spun his theory of the protective power of vaccination, and then demonstrated the correctness of that theory, in spite of the averted faces of his professional brethren, the treatment of small-pox

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\* Presented at meetings of Ohio State Medical Society.

has almost ceased to be a subject of interest to us. But who can estimate the extent to which the world has been enriched by the economy of young and vigorous life resulting from this discovery? Yet preventive medicine, so auspiciously born, was dandled and fondled by its admiring, conservative—shall I say fossilized—nurses, until its skin was shrunken and wrinkled by age (or, at least, must have been, had it been a real rather than a supposed baby). The medical profession for a long series of years after Jenner's discovery acted with contentment and satisfaction as a nurse (a "dry nurse") to preventive medicine. The old dame, however, was finally awakened from her senile lethargy by the startling and revolutionary announcement, that many of the most destructive and intractable diseases are preventable. Her glassy eyes took on an expression of interest and speculation, her pulse quickened, color came to her cheek, the wrinkles which marred her wholesome countenance disappeared, her shrunken muscles swelled to harmonious fulness, and the milk of human kindness tingled anew in her swelling breasts. She took this long-neglected child, preventive medicine, to her bosom, and having consulted her old Greek authorities, was reminded that Hygiea was the daughter of Æsculapius, and boldly and emphatically reasserted the close relationship of prevention to cure. Why should not you, the followers of the father, to-day claim also the right to be considered the chief patrons of the daughter? Yet there are those who are ambitious to share this primacy with you, or even take it from you. The medical profession cannot afford to belittle, and is not disposed to ignore, the growing army of sanitarians in special lines; on the other hand, we cannot but rejoice at the growth of interest among architects in the sanitary bearings of their work. The time is coming, if it is not already here, when the warming and ventilation and the proper drainage of a house or a public building will be given more attention by architects, though the harmony and proportions of the exterior may not claim less, and the artist who aims at beauty as an end will not be so highly esteemed in his profession as the man who always keeps the question of healthfulness before his mind. The great architect will be the one who attains both without sacrificing either. The ideal of the truly great architect must combine these elements in their order—health-

fulness, utility, and beauty. Increasing attention is being paid to plumbing, and the time is drawing near when a reputable plumber almost anywhere may be trusted to do safe work, and the death traps, formerly so common a feature of a great deal of the plumbing work, will disappear with the men who made them, because they knew no better.

The proper ventilation of houses and public buildings is being more and more taken into consideration by the people—in fact, the people are interesting themselves in questions of personal hygiene, in all their bearings, to an extent never before known, and are crowding upon the heels of their leaders with appetites rendered only the more keen by the crumbs of sanitary knowledge which they receive. The day is close at hand when *security of human life will be recognized for what it is—the real basis of all values.*

Education is all that is needed, and there must be a low moral tone in the community which, having learned the effectiveness of sanitation in the prevention of disease and the prolongation of life, refuses to use the means requisite to put and keep its surroundings in good wholesome condition.

The plumbers have been making very commendable progress in the past few years; there are many of them who can be trusted to do safe work in their line; but some of them, by reason of having learned their trade well, have come to consider themselves commanders in the sanitary army, and “to assume that the whole burden of practical sanitation rests upon their shoulders, and to felicitate themselves that doctors and architects have heartily joined with them, who have always done, and are still doing, everything that is necessary to do about the relations of plumbing to health. Physicians who have kept themselves abreast with the advance of knowledge of the etiology of disease, and have been foremost in the detection of bad plumbing by a knowledge of its results, are not only unnecessary but meddlesome—they know how to cure disease—nothing about how to *prevent* it. Chemists and engineers stand in the same relation, and all must now stand off” (SANITARIAN for April, 1887). Indeed, we are in danger of having an army of trades seeking to place themselves in the sanitary priesthood.

The butcher who knows wholesome meat and furnishes it to his customers is likely to become the “sanitary butcher.”



The honest and well-qualified grocer, the "sanitary grocer;" and the interminable procession takes up its line of march—"the sanitary tailor," the "sanitary shoemaker," the "sanitary cook," and the sanitary what-not—all claiming to be *priests* rather than *worshippers* at the altars of Hygiea.

I recently heard an aged and deservedly honored school superintendent almost devoutly congratulate a sanitary convention on the newly-discovered fact that the "doctors are *beginning* to take an interest in sanitary matters." So you see that physicians are not so universally recognized as the leaders *ex-officio* in the sanitary reform as might be supposed. You will no doubt be slow to abandon your rightful and traditional claim to leadership, yet it is conceivable that abdication may become necessary in order to avoid deposition. It will be a veritable day of wrath for our profession when the weighing process, which is going on more and more diligently every day, shall have demonstrated our unfitness to lead and instruct the people in matters of personal hygiene and public sanitation.

But are the young men who are entering the profession as well equipped as they ought to be? Can you, on the spur of the moment, bring to mind the medical college which is doing its duty toward its students and the people in this regard? What college has a Chair of Hygiene and Sanitary Science? Is this immensely important subject given an honorable place in the faculty—a place even as prominent in the work of the session and in the examinations as it occupies in the announcement? It may be said that all the chairs teach it—so all the chairs teach anatomy, yet who would consent to place anatomy on a one-legged stool—a chair which cannot stand without the incidental support of other chairs?

The hour has struck when the times are likely to outrun the physician who is not well informed in questions pertaining to practical sanitation; when the medical profession of Ohio can ill afford to concede to a handful of men with voluble mouths and ever-flowing fountain pens the modest claim they constantly put forward, in season and out of season, in execrable English, that they are the men *par excellence*, and the only men in the State, who are at all entitled to the name of sanitarians. If the medical colleges do not measure up to the occasion, and the physicians are found wanting, the people will have leaders from other sources.



The physician who has a rustic reputation for being "good in fevers" must, at least, *share* his glory with the one who can and will search out and designate the causes and demonstrate the possibility of prevention. The physician who can uncover the hidden danger which threatens the whole family or community must come more and more, in the opinion of the people, to dispute the supremacy with the one who skilfully conducts the sick one to health or to death. You have taught your intelligent patron that many diseases are self-limited in their nature; that you do not treat diseases by name so much as by careful study of the conditions in each individual case; that specifics are not numerous, and are not increasing in number. He is now asking you to advise him as to the location of his well, the ventilation of his house, and the safety of his sewer connections and house fixtures. Will he listen with satisfaction to a discourse, however learned, on the constituents of respirable air and the benefits to be derived from breathing such air, and the results likely, or sure, to follow the breathing of foul air? No; he will expect you to tell him how to solve the problem of securing air which will be safely pure as well as comfortably warm, when the thermometer indicates several degrees below zero.

Does your present knowledge qualify you to lead him out of his difficulties or into worse dangers than those he at present realizes? His plumber, strange as it may seem, will often fail him as a sanitary adviser. You must know how much dependency is to be placed in a trap, how the house system of pipes is to be ventilated, where vents are to be placed, all to the one end in which he is interested—getting rid of the sewage of his house with safety to himself and family. So long as we invite the blind to trust themselves to our leadership, can we be innocent and neglect to constantly and earnestly cultivate our own sense of vision?

The problem of saving the eyes of the children in our schools waits urgently for practical solution. The parent listens while you explain the form of the myopic eye, and the optical reasons why it is myopic, but his heart sinks when you tell him it is incurable. He knows you can adapt glasses to most optical defects; he wants the eyes saved, not supplemented by machinery. Here is a loud and importunate demand for prevention.

This question has been studied for many years in this country and in Europe by able and enthusiastic men ; the results of very elaborate investigation and research have been placed on record ; the solution of this most important problem is, no doubt, well advanced ; but as yet the development of defects of vision during school years remains a very grave and stubborn fact, which is variously explained. The very variety of explanations, indeed, serves to show that speculation still constitutes a large element in the literature of the subject.

This leads to the question whether physicians ought not, in some respects, to place themselves in more immediate contact with the people politically. I would not suggest that we become politicians, but ought we not to interest ourselves, specially, in the composition of boards of education, for instance? There is not a board of education in Ohio to-day that would not be better for having a physician in it—a man interested, intelligently, in the physical welfare of the children ; one who appreciates the necessity of fresh air and abundant and proper light ; who knows the difference between work and overwork, and can measure the effect on physical development of all unsanitary surroundings and dangerous methods in the schools.

The people are filled with the idea that schools are maintained purely for the cultivation of the mind, or rather for the purpose of instilling, or injecting, or impounding a certain amount of knowledge ; and their representatives on school boards are too often men who believe that the climax of success in the management of schools is reached at exactly the same moment as the minimum cost per capita per annum. Inferior teachers are preferred, because they cost less ; well-known principles of construction are ignored for economical reasons ; ventilation is neglected because fuel is an important element in securing it ; and coal costs money. The sacrifice of health cannot appear in an annual report ; it is consequently of no importance ; blood is cheaper than coal.

The people need to be reminded that a well-stored, or even a cultivated, mind is of little value in a puny, dying body ; and, on the other hand, that a good physical organization will find its place and make its way in the world, if it only knows enough to come to its meals.

They should be taught that the aim of education is to lead

out and develop the moral and physical powers, as well as the mental faculties.

We want men and women of symmetrical proportions in every sense, who may be looked at with satisfaction from all sides, not specimens with a grand brown stone front and a tumble-down clapboard kitchen in the rear.

Physicians should make themselves felt in school boards, whether they are members or not. The welfare of the coming men and women who are to manage the affairs of our country is largely in their hands.

There are many towns and cities of considerable importance in our own State which have no boards of health. To be sure, there is not likely to be any great amount of pecuniary advantage growing out of an attempt to have some orderly and systematic effort made in a sanitary direction; yet it is a question whether physicians can afford to admit that their calling is altogether mercenary, and not in any degree benevolent, and it is not very easy to discover the hiding-place of beneficence in even honestly and skilfully treating disease which we could have prevented.

Physicians abdicate their claims as leaders in sanitary matters by declining to serve on boards of health or as health officers. Do not the people look in vain in such cases for leadership to the men who ought to be their leaders? The consequence is, that in the presence of pestilence the physician is often unqualified to give safe advice, and must either, with shame, acknowledge the truth or essay, in his conscious or unconscious ignorance, to lead the people who trust him. While all physicians are, or ought to be, *theoretical* sanitarians, would it not be wise for them to seize every opportunity to make themselves *practical* sanitarians?

When the people are satisfied that we have valuable advice to give as to the preservation of health or the prevention of disease, they will be willing to pay for our services—at least, as willing as they now are when they are sick. Our relations with the people will become more happy when we can meet professionally under more favorable circumstances than usually surround the bed-side of the sick and dying.

Many years ago a prominent physician in an Ohio town, which has since grown to be quite a pretentious city, was



asked to contribute to a fund for filling a vile pond or swamp in the centre of the place. He answered that he "would not give one cent, as every house around had among its inmates more or less sickness due to that swamp, and it would not do to diminish the medical revenues."

Probably a few of you have heard the senile and decrepit joke which some people who are not otherwise fools delight to inflict on physicians, by inquiring whether or not it is "distressingly healthy"—the implication being that your happiness approaches exultation exactly in proportion as the calamities and afflictions of the people increase.

If the physician who treated the first case of typhoid-fever at Plymouth, Pa., had secured the destruction or thorough disinfection of the dejections from that case, there would have been a tremendous deficit in the "professional revenues."

To be sure, the people would not have known the terrible calamity which was averted, and would not have even recognized his humane and intelligent skill; but when a man comes to settle with himself, where would he prefer to be, with the one who indifferently or ignorantly allowed the seeds of that scourge to be sown under his eyes, or with the one who, unseen and single-handed, throttled the monster at its birth, and saved the people? That epidemic cost \$67,000 direct. The loss of earnings reached over \$30,000; but how shall we measure the distress incident to 1200 cases of sickness in a population of 8000, and the loss to families and the State growing out of 114 deaths?

The State Board of Health of Pennsylvania, or Ohio either, would have furnished to any one all the information necessary to have prevented that epidemic without expense beyond the cost of a postal card.

Plymouth saved that cent, and poured out \$100,000. Sanitation is comparatively cheap.

The time will soon come when the people will take their chances with the ordinary trifling ailments which constitute more than half the physician's work rather than call in a physician who is in attendance on any of the contagious, preventable diseases. Then those who need it will be furnished with a pecuniary stimulus to drive these enemies of the human race outside the boundaries of civilization.



RULES OF THE NEW YORK STATE BOARD OF  
MEDICAL EXAMINERS.—NO KNOWLEDGE OF  
SANITATION REQUIRED.

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A LAW of 1874 established for the State of New York a State Board of Medical Examiners. Frequent deaths and occasional resignations changed its original membership several times, until, upon the recommendation of the undersigned (who, therefore, objected repeatedly to his own appointment), and for reasons easily understood, all the members of the present Board, with one exception, were selected, by the Honorable the Board of Regents of the University of the State of New York, from among the medical men of Albany, the seat of the Government and the Board of Regents.

The profession never expected the law, as it was passed in 1874, to be efficient. It was believed by many that some of the medical colleges objected to the establishment of a State Board altogether, though others were known to favor it. It was certain that sectarian influences succeeded in undermining the passage of the original bill and emasculating it. *It is certain* that no State Board of Examiners will ever benefit either the profession or the public—both of which stand in equal need of it—before the license to practise medicine will depend on the *compulsory* passing of a successful examination before the State Board. As the law stood, nobody ever applied for examination, and the degree of M.D. of the University of the State of New York, who was in the possession of a diploma from a college in good standing. Such few as volunteered to come forward were men who had previously failed in their college examination, or “practised medicine” without study, knowledge, or any title whatsoever. There being no rules and regulations referring to a minimum of accomplishments or requirements, a few of these were let loose upon the unsuspecting public with a diploma; the majority, however, failed.

When the new Board was appointed in the beginning of this year, its members accepted their positions upon the condition that the Board of Regents would authorize a number of

rules and principles which were to regulate the examinations. As such have been approved by the Regents, I am directed by the Board of Examiners to present them to you, for your information and, if you deem proper, for publication and comment. We know quite well that, as long as the examination by the State Board is not made *compulsory*, any number of rules and principles will prove their inadequacy and inefficacy again and again. But the present Board hopes that its earnest recognition of the rights and dignity of medical science, art, and practice will be admitted by, and found acceptable to, the profession, and that the latter, after a minimum of requirements for the admission into the ranks of the profession has been officially accepted by the Regents, will feel encouraged to continue its exertions in behalf of both the elevation of the standard of medical education and the protection of the public.

Not one of the recent applicants for a degree has proved successful. One of them had failed in his college examination a few weeks previously, and now threatens to swell the number of graduates of the "university" of a neighboring State. Similar occurrences are not rare at all. Candidates failing in one college will obtain their degrees from other colleges in the same or other States. Will not that suggest the necessity instead of a "State Board" of a United States Board of Examination?

Very respectfully,

A. JACOBI, M.D.

110 WEST THIRTY-FOURTH STREET,  
NEW YORK, July 25, 1887.

STATE BOARD OF MEDICAL EXAMINERS.

The members of the State Board of Medical Examiners accept their positions with this understanding :

A candidate for the degree of Doctor of Medicine, to be given by the Board of Regents, either desires an additional degree after he has received a diploma from a chartered medical college, or he has no diploma from any chartered medical college, and desires or prefers one from the Board of Regents. The degree given by the Board of Regents is to be, or become, an honorable distinction. It must be the object of the

law to protect the people and to ennoble the medical profession, and not to facilitate the entrance into it of persons unfit or unqualified. The profession does not require larger numbers, but does insist upon an elevated standard. Therefore, the examination must be strict, and must be conducted according to the following rules :

1. The examinations before this Board shall be conducted in the English language, exclusively.

2. The candidate shall be allowed two and a half hours for each examination. The examination shall be in writing. The candidate must not consult books, extracts, notes, or persons, and must not communicate with any one during the two and a half hours allotted to him. To do so is to be considered a failure to pass.

3. The examination in clinical medicine and in clinical surgery shall consist in the actual examination of patients by the candidate, and a discussion in regard to the diagnosis, prognosis, and treatment of the cases.

4. The examination in chemistry shall include the actual testing of a specimen of urine, in regard to its reaction, specific gravity, and the presence or absence of albumen and sugar.

5. Each examiner shall have the privilege, if he so desire, of supplementing his written examination by an oral one, in the presence of two other members of the Examining Board.

6. The scale of marks shall be from zero to ten ; ten being perfection, and anything below six being a failure to pass the examination.

7. The questions and answers, with their marks, shall remain in the possession of the Board of Regents, and shall be open to inspection.

8. When the candidate shall have completed all his examinations the Board of Examiners shall meet and hear the result of the examination in each branch. And within ten days thereafter each member of the Board shall make a written report as to the merits and acquirements of the candidate ; being guided in this report, not alone by the result of the examination in his particular branch, but also by the result of the examinations in the other branches. And each member of the Board shall send his report, together with the questions and their answers and their marks in his branch, to the secre-

tary of the Board of Examiners to be by him transmitted to the Secretary of the Board of Regents.

And, furthermore, it is the opinion of the Board of Examiners : That in order to receive the degree of Doctor of Medicine, the candidate should successfully pass in every branch; or at least in every branch but one.

#### STATE BOARD OF MEDICAL EXAMINERS.

ABRAHAM JACOBI, M.D., President, Examiner in Pathology.

ALBERT VANDERVEER, M.D., Vice-President, Examiner in Surgery and in Clinical Surgery.

HENRY HUN, M.D., Secretary, Examiner in Clinical Medicine and in Materia Medica and Therapeutics.

JAMES P. BOYD, M.D., Examiner in Obstetrics.

FRANKLIN TOWNSEND, M.D., Examiner in Physiology.

SAMUEL R. MORROW, M.D., Examiner in Anatomy.

WILLIAM HAILES, JR., M.D., Examiner in Histology.

WILLIS G. TUCKER, M.D., Examiner in Chemistry.

—From *The Medical Record*.

#### EDITORIAL COMMENTS.

Presumably candidates will be required to know something about the hygiene of the sick-room, and those from the Albany Medical College, in particular, possibly something about the relation of Troy's sewage to Albany's water-supply; but of the relations of cesspools and sewerage to the healthfulness of domiciles and towns they may be totally ignorant, and yet be thoroughly competent in all the subjects required of them according to the schedule. And so, too, with regard to the relations of locality and climate to health, generally; the influence of meteorological changes; the dangers of filthy soil and noxious emanations therefrom; the relations of occupations to health and of pernicious agencies therewith connected; the perils of the school-room; the cost to the community of preventable sickness and premature deaths; the relations of pauperism, vice, and crime to health—such knowledge appears to be deemed unnecessary by the Board of



Examiners "to protect the people and to ennoble the medical profession, and not to facilitate the entrance into it of persons unfit or unqualified."

Candidates must know the results of these conditions as they are observed upon the dead body: how to treat wounds and dress fractured limbs; the remedies for filth diseases; the treatment of premature labors and puny infants; the departures from normal physiological functions; how to detect and describe the changes caused by disease in the tissues, blood, and secretions. But *how to prevent* these conditions is of too little consequence to the ennobling qualifications of the medical practitioner or to the people of the State to be included in the schedule of requirements!

Yet it has been by the practical application of such knowledge that more than a million lives have been saved in Great Britain during the last fifty years; that the death-rate in that country has been reduced from 22.07 to 19.62 per 1000; and the death-rate from zymotic diseases from 4.52 to 2.71 per 1000. In the decade 1850-60, the annual average saving of lives in England and Wales from practical sanitation was 7789; 1860-70, 10,481; 1870-80, 48,443; and in the five years, 1880-84, the average annual number of lives saved by the exercise of such knowledge as the State Board of Medical Examiners ignores was 102,240.

Practical sanitation has made too little progress, and the reports of disease and mortality statistics are too imperfect in the State of New York to show any comparative results with those of Great Britain. But it may be remarked that, notwithstanding the advantages of a much less dense population, the present death-rate of this State is about equal to that of Great Britain, and in our cities, at least, it is much greater—an average of about 24 per 1000 as against 18; and from zymotic diseases, 3.70 to 2.70—figures wonderfully suggestive of the importance of sanitary knowledge, and why it should be required of every candidate for a medical degree. The incompleteness of the requirements for the Medical Degree of the University of the State of New York is conspicuous for its deficiency and for its conformity to the curriculum of the colleges with which the examiners are identified.

LEPROSY IN THE SANDWICH ISLANDS.

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By CHRISTOPHER GRONVOLD, M.D., Member of State Board of Health of Minnesota.

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THE Sandwich Islands have of late years had a terrible visitation, that, together with other causes, threatens to blot the little nation out of existence. These beautiful islands with their delightful climate—the range of Honolulu is between  $88^{\circ}$  and  $58^{\circ}$ —have been attacked by leprosy, this mysterious disease, that has been known for more than four thousand years, and of whose prevention and cure we at present know about as much as was known at that time, it being yet considered incurable, and segregation proving the only efficient way of prevention.

The first case of leprosy that was recognized as such by a professional man (Dr. Hillebrand) dates from 1853, and as it was then unknown to the native Hawaiian, but familiar to the immigrated Chinese, who knew it from their old home, it was called the Chinese disease (Mouritz, Meyer). It had probably existed for some time before, but then diagnosed as syphilis, with which the greater part of the nation had been infected since the arrival of Cook, and the opening of intercourse with other people. In 1840 the disease was recognized in Honolulu by Mr. Brickwood, who had previous knowledge of it in Egypt. And yet earlier, in 1823, there seem to have been allusions made to it in the day book of one of the American missionaries, Rev. Charles Sam Stewart, who that year landed in Honolulu.

The way in which leprosy was introduced to these islands, as well as the date, has occasioned a variety of opinions. *President Gibson* believes that the disease had been “dormant in the Hawaiian blood” since the days of the settlement of the islands, eleven hundred years ago, by emigrants from the Indian Archipelago, the disease probably appearing now and then in individual cases, in a greater or less degree. The

present inhabitants of Java and adjacent islands present striking affinity with the Hawaijans, and are afflicted with the same diseases. The deterioration of the Hawaiian people by the invasion of syphilis and other diseases prepared the soil for leprosy and its unprecedentedly rapid spread, one cachexia making the system less able to resist the other.

It seems reasonable, with Meyer and others, to suppose that the disease has been imported by the mixed crews of whale ships, which consisted of colored and white, Chinese and Portuguese, and others from countries where the disease is endemic.

The sudden spread of the disease seems only capable of explanation by supposing it to be contagious ; and that it is so is the unanimous opinion of physicians and others who have studied the disease at the place.

Contagiosity being admitted, its sudden spread and virulent character are only new illustrations of the old rule, that a disease is most violent when it first attacks a nation, especially if this is small and so perfectly isolated as the Hawaijans were. This luxurious climate and soil also invite to indolence and carelessness in precautions, as well as lessen the power of resistance.

This nation was, moreover, already weakened and demoralized by the invasion of syphilis, small-pox, and other evils attendant upon civilization. Syphilis, in its different stages, has been supposed to have infected four fifths of the native population ; and this disease is by some supposed especially to dispose to leprosy. It is also observed that leprosy is more frequent in places where immorality is greatest (Hutchinson).

To give an idea of the state of affairs in this respect about sixty years ago, we will see what the Rev. Charles Sam Stewart writes in his day-book in 1823 : " Not to mention the frequent and hideous mark of a scourge which annually consigns hundreds of this people to the tomb, and converts thousands, while living, into walking sepulchres. The inhabitants generally are subject to many disorders of the skin. The majority is more or less disfigured by eruptions and sores, and many as unsightly as lepers. The number of either sex or of any age who are free from blemishes of this kind is very small, so

much so, that a smooth and unbroken skin is far more uncommon here than the reverse is at home" (Dr. Mouritz's report).

In another place he writes : " Indeed, we seldom walk out without meeting many whose appearance of misery and disease is appalling, and some so remediless and disgusting, that we are compelled to close our eyes against a sight that fills us with horror. Cases of ophthalmic scrofula and elephantiasis are very common." As elephantiasis arabum is not found on the islands, it must be *e. græcorum* he refers to.

The following figures will also show what havoc the contact of civilization has worked on this people. In Cook's time, a little more than one hundred years ago, the number of inhabitants on the islands was calculated to be about 500,000 ; fifty years later it was 142,000, hardly one third ; in 1853, 73,000 ; in 1886, 40,000 was all that was left of the Hawaijan race, while immigrated Chinese and some white people swell the number to 75,000 as the present population.

The warm and, on the wind-side, moist temperature of the country favors the development of leprosy, as a disease principally of the tropics and sea-coasts, while it is only exceptionally found at present in colder climates. In China the northern part is said, by the Chinese, to be exempt from the disease (Hillebrand's report), and southern lepers going north are said to improve, but get worse again when returning south. More than anything else the habits of the people and their promiscuous intercourse promote the spread of this disease. They are most hospitable, and receive strangers without any precautions against disease. " The lepers are welcomed in their midst with open arms" (Mouritz) ; they don't seem to find the disease loathsome, and whole families are infected.

The present number of lepers on the islands, in and outside of the hospitals, is supposed to be about 1500, or two per cent of the whole population. Among 3076 lepers received at the leper settlement at Molokai, since its opening in 1866, 22 were Chinese and 16 whites—to wit, 6 Germans, of whom 3 are alive ; 4 Americans, 2 alive ; 4 British, 2 alive ; 1 Pole, alive ; and 1 Portuguese, dead ; leaving 8 white lepers alive February, 1886. Of Chinese, there are proportionally few, considering that they make the bulk of the immigrants.



If ignorance and carelessness have brought this pestilence upon the people, it has manfully stood up to the emergency as soon as it saw the danger. In 1865 a law was passed "To prevent the spread of leprosy," etc., that enforces isolation of lepers. There is established a Board of Health with authority to carry out the provisions of the law. Physicians, subject to the order of the Board, are distributed over the islands for gratuitous treatment of all Hawaijans (in the report for 1886 there are named twenty-eight, of whom fifteen did service at the same time). For sanitary purposes (hospitals, quarantine, salary of physicians, etc.) was expended in the last two years \$264,500, or about one tenth of the whole revenue of the kingdom.

The Government physicians send biennial reports of their doings and observations to the President of the Board. Among them those of Drs. Arning and Mouritz are especially complete and interesting.

One of the principal points to be decided, and that one of great practical bearing, is the question of contagiosity. All physicians and others whose calling has given them the opportunity of making observations agree that the disease is contagious (with one single exception, Dr. Fitch, who considers it a fourth stage of syphilis).

"The whole history of leprosy in the Hawaiian Islands, from its propagation to its present rapid spread and development, verily proves that it can only be accounted for by regarding it as a contagious disease. Whatever else can be said of its being non-contagious in other countries, where the disease exists endemically, these statements do not apply to the disease in the Hawaiian Islands" (Mouritz). "It is simply the extreme slowness of its action and development, the apparent immunity from it, which so many seem to possess, and the imperceptible manner of its communication, which could have led to the conclusion that the disease is non-contagious" (Meyer, agent Board of Health, who has lived on the islands for thirty-six years).

Dr. Mouritz gives the following reasons for declaring the disease contagious :

"1. *Hereditary disposition cannot explain* all the cases on the islands, as the Hawaijans are not a prolific race, and as among lepers sterility is the rule. Also most of the offspring

of lepers are stillborn, or die within a short period after birth. There were, January 1st, 1886, 653 lepers in the settlement, and in the last fifteen months five children have been born, of whom two are alive ; and it is doubtful whether these will reach maturity, and even then they may illustrate the law of atavism.

“ 2. *If no hereditary history is obtainable*, facts can invariably be elicited that contact with lepers, for long or short time, has existed.

“ 3. Foreigners from countries where the disease is unknown, and who have not before been in contact with lepers, have, after settling on the islands, become victims of the disease, among them the Rev. Father Damien.

“ The Rev. Father Damien, a Belgian, came to the settlement of lepers in 1873. He was then thirty-three years old and of good physique, enjoying a robust, good health, and has since lived there continuously, being daily and hourly in contact with lepers of every grade. Until in 1884 he felt fairly well. In that year pains in his left foot troubled him ; they continued to get worse, and were, in the absence of other signs, referred to rheumatism. Consulting Dr. Arning, this gentleman diagnosed it as leprosy, the symptoms pointing to deposits of leprous matter in the structures connected with the peroneal nerve in the flexure of the knee. Eight months afterward a small leprous tubercle manifested itself on the lobe of the right ear. From that time diminution and loss of eyebrows, infiltration of integuments on forehead and chin, are slowly but certainly going on, and he is at present a confirmed leper.

“ That there are people who possess immunity from leprosy, and for years may live with lepers without being infected, is not more than is often the case with other infectious diseases. Not everybody will catch it, but many do. In the last twelve months seventeen Kokuas (healthy people that do work in the leper settlement) out of 178 have developed leprosy, about 9.5 per cent. At that rate they would all be infected in twenty years, if they do not possess immunity.”

Dr. Arning, an able German scientist, was called to the islands in 1883 to study the disease at the place and investigate the causes of its sudden spread. He has given a statement of his clinical and anatomical researches in his biennial report for 1884-86.

I. A number of lepers were examined by him as to the *presence or absence of leper bacillus*, and he summarizes his results as follows :

1. *In the tubercular cases* the bacillus is found in all nodules and diffused infiltrations, whether on the skin or on the mucous membranes of mouth, throat, nose, rectum, and large intestines ; in the softening and breaking down of these nodules the bacteria are plentifully mixed with the discharge.

2. *In the anæsthetic cases* the bacillus is *not* found in the patches nor in the necrotic parts of the skin, tissue, or bone, *but* in the nerves supplying these mutilated parts with vitality. In the leprous ulcerations of the nose, that sometimes occur in these cases (Boeck, Danielson), the bacillus is found.

3. The bacillus is *not found in the bright, red patches*, frequently ushering in the first attack, and mostly occurring in the face, depending upon leprous disease of the nerve supplying the part.

4. *Neither in the urine*, which the Chinese consider the worst infection carrier.

5. *Neither in the blood*. For all that, the germ may be contained in the blood, more especially during the febrile attacks, possibly in some hitherto unknown but suspected form of spore condition, a stage of the life of a bacillus. These suspected spores may be invisible, either on account of their minuteness or on account of our inability to make them visible by the staining methods we use in searching for bacteria.

II. As regards the *anatomical work of Dr. Arning*, he found in all advanced cases grave changes in the larger viscera, more especially in the lungs, liver, spleen, and bowels. The ulcerations of the bowels and the breaking down of lung-tissue are due to leprous infiltration, and we shall have to modify our opinions of leprosy as being mainly a disease of the cutis and peripheral nerves, and *introduce terms such as phthisis leprosa, and enteritis leprosa*.

*Brain and spinal cord* he found unaffected, but they will yet need a very close and searching microscopical scrutiny, as all the material collected.

III. The question of the *etiology of leprosy, the bacterial, research*, was another important part of Dr. Arning's investigations.



1. *Culture experiments of the bacillus* in artificial soil (gelatines, bouillon, etc.) have so far given negative results, as has also the search for the bacillus in air, water, or food.

2. *Neither did inoculations in a variety of animals*, guinea-pigs, hogs, pigeons, rabbits, rats, and a monkey, give any positive result. For months the presence of the bacillus could be followed up at the spot of inoculation; but not in any single instance have the general symptoms of leprosy been observed.

*Inoculation on a condemned convict* has not yet (fourteen months later) given any results, although the bacillus all the time could be traced at the place inoculated. How long the period of incubation may be Dr. Hillebrand's case from Borneo will show. A white boy played with a colored leprous child, who thrust a knife into the anæsthetic part of the body, and, for imitation's sake, the white boy did the same on his body with the same knife. After this he left for Europe, where he grew to maturity, and nineteen years afterward he developed the disease, and became a confirmed leper.

Dr. Arning sums up his conclusions as follows: "(1) The bacillus lepræ is a parasite, limited to the human race. (2) It may be transmitted either directly from an individual (3) or run through a term of intermediate life (spore condition), which we are at present unable to detect, but which may be present in soil, water, or food, whereto it can only be carried from diseased tissue of a leper. (4) Accepting either theory, the direct or indirect transmission, *we must look upon every individual leper, whether in the incipient or advanced stage of the disease, as a dangerous focus of the malady*, he multiplying and nursing the germ in his tissues. (5) *The leper germ requires a certain disposition of the human soil, to strike and thrive*. What this peculiar disposition may be we are at present unable to define. It is evidently a disposition which may coexist with apparently good health, as is shown by many instances of strong, robust men developing the disease. This disposition may possibly be transmitted by heredity."

*Contagion* is then considered the principal way of originating the disease, and Dr. Mouritz puts this as the cause of it for seventy-six per cent of all the lepers.

I. *Contagion may enter the system* (Dr. Mouritz) *by inoculation*.—(a) At broken surfaces of the skin or external mucous membranes; sexual intercourse seems to give a chance for



inoculation, at least, when there are sores and abrasions at the place of contact. Many such cases are told as the following : A man after direct contact with a female became aware of a small sore on a certain part of his body. This was treated as syphilis, without improvement. Later on, spots appeared, eyebrows diminished, and he was declared a leper.

Dr. Peters, in India, has made observations in a similar direction. After accidental cutting or abrasion of epidermis, or after walking on a gravelly road the abrasions became the starting points for leprous sores.

(b) *Vaccination has undoubtedly originated leprous cases.*—Dr. Mouritz supposes two per cent of all. Dr. Arning vaccinated a number of lepers, but the vaccination only took in three cases—one tubercular and two anæsthetic. In the tubercular, both the lymph and crust contained the bacillus lepræ ; in the anæsthetic no bacillus could be detected.

(c) Dr. Arning is making investigations concerning the possibility of the *leprous virus being conveyed by mosquitoes and other insects*. The elephantiasis arabum, endemic in some parts of the tropics, but unknown here, has been traced to propagation by mosquitoes, and by these only.

II. Contagion may also *enter the system by inhalation*, or inoculation of contagious particles, conveyed in the exhalations of the lepers, on internal surfaces, tonsils, bronchial surfaces, or they may be swallowed in the stomach. This is the most frequent way of propagation, and is supposed to cover the Rev. Father Damien's case.

*Hereditary predisposition* is, by Dr. Mouritz, ranked next to contagion, as the chief agent in causing the spread and perpetuation of the disease, as in leprosy the best exponent of predisposition is found. In twenty-eight per cent of the lepers this predisposition is supposed to have existed.

*The character of the disease* seems of late years to have become milder, according to the testimony of most reporters. As a common rule endemic and epidemic diseases will modify their character with time and circumstances, and milder forms will commonly follow the more malignant type. Dr. Hillebrand gave in 1865 the average duration of the disease as three to five years, while Arning, in 1884, puts five to ten years as the time, and at present there are many cases where the disease has lasted longer.

Dr. Arning has, when examining for leprosy, met with several cases with only one or more symptoms of the disease ; he calls them *abortive leprosy*, and hails them as signs of a decrease of the violence of the disease.

"It has also been commonly observed that the tubercular form, although yet prevalent, more than three to two in the leper settlement (of 652 lepers, there are 333 tubercular, 204 anæsthetic ; and the rest, 115, belong to the mixed form), is yet not so frequently met with now as was the case before. It has decreased, compared to the anæsthetic form, which is the less active and the least rapidly progressive" (Dr. Mouritz). "I may mention," the doctor says, "that I have heard the opinion expressed by many able physicians of Europe, that in countries where leprosy has existed to a recent date, although now extinguished, various obscure nervous affections do occur from time to time, which probably are lingering relics of anæsthetic leprosy."

In China it is the opinion that the disease may run out, of itself, frequently in four generations (Dr. Hillebrand).

*In regard to sex*, old and new statistics go to show a prevalence of leprosy among the male sex, about as two to one. Out of 3076 lepers received at the leper settlement, 1972 were males, 1104 females. Females are more apt to transmit the contagion than the male.

*Age* can be anywhere from childhood to old age. Dr. Arning has seen signs of leprosy in a boy three and one half years old, and found a marked case at four years of age.

*For prevention of the disease* all recommend *rigid segregation* as the only security. In Norway it is the transferring of lepers to hospitals that has worked the decrease of the number (Hanson) in ridding the country of so many centres of contagion.

It is necessary to *dispose of the dead bodies, houses, and effects of lepers*. The houses of lepers and their contents have repeatedly proved to be a focus of infection, and ought, consequently, to be burned, instead of being used again by healthy people.

*Arning considers a leper's body a constant menace* to the community. The bodies of dead lepers ought to be burned or disposed of by quicklime, as the germs of leprosy offer a great resistance to putrefaction. Leprous tissue and matter was set

aside under conditions of temperature and moisture most conducive to slow and thorough putrefaction, while the growth of the larger fungi was at the same time carefully excluded. Microscopical examination showed that the characteristic bacillus lepræ not only held its own, but seemed actually to have increased. Examinations, eight months afterward, of the remains of this leprous tissue showed it to consist nearly entirely of swarms of the bacillus lepræ, closely packed, while every vestige of cellular and fibrous structure had disappeared; even the bacillus of putrefaction had crumbled up into a mass of detritus. In the body of a leper buried five months before leprous germs were found in great numbers.

The question whether these bacilli are alive and capable of reproducing the disease will only be solved when artificial cultivation of the germ and inoculation have been successfully carried out.

*Treatment of lepers* comprises principally hygienic measures. In anæsthetic cases electricity will be of great benefit; for external use salicylic acid and gurgun oil to heal sores. Surgical interference will in many cases be most beneficial. Many eyes could be saved and life made more comfortable. Lepers stand surgical interference very well. Sores heal on them as on others.

Dr. Goto's treatment is favorably spoken of. It is that commonly used among the Japanese and other Asiatic races. As *the hygienic part*, baths were taken two or three times a day in water from 90° to 100°, medicated with a few ounces of infusion of the bark of *Æsculus turbinata* (a kind of horse-chestnut), with some sulphur and other ingredients, all to promote cleanliness, free perspiration, and activity of the pores of the skin, so as to get rid of unhealthy secretions. As *the dietetic part*, strong, nourishing food was given to build up the debilitated system: rice, milk, beef, mutton, chicken, eggs, broth, vegetables, and fruit.

*The medical treatment* varies with the condition of the patient, the stage and character of the disease. The two chief medicines he calls "seiketen ren," internally, and "yokuyaka," for bath, if anybody is wiser for knowing it. One of the other physicians has requested the Board to publish the medicines used, and not allow any arcana (secret remedies).—*From Public Health in Minnesota.*

## RAINFALL AND WATER-SUPPLY.\*

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By JOHN BIRKINBINE.

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THE close relation, or rather, we might say, inseparable connection between rainfall and the procurement of a supply of water for public or domestic uses, while recognized in a general way, is far from being appreciated ; and we are apt to forget that all available permanent water-supply is directly traceable to rainfall. Perhaps you will correct me, and advise the use of the terms "directly or indirectly," but we are probably justified in using the term "directly." Nature's laboratory is not a secret one ; we can see, if we will, the methods which are employed to accomplish certain ends ; and can notice the direct connection between rainfall and all water-supply. We admit that all visible streams or water-courses are immediately traceable to the rain which falls upon their respective drainage areas ; and the many unseen or underground streams (the presence of which are determined by various methods which expose the formation of the earth) also owe their existence to certain territories upon which the rain is precipitated, and which are underlaid by certain stratifications of rock or to bodies of water which intercept these strata. The geological structure of a specific district, therefore, naturally affects the water-bearing strata and their position in relation to the surface ; but it is generally the disturbed condition of the rocks which causes these subterranean waters to rest in basins or pools, or to find vent as springs. Although where the stratification is regular, and its seams or crevices are continuous, water is often obtained at great depths, apparently beyond the influence of rain, or, as far as can be determined from any connection with other reservoirs, the source from which this water comes, and that which maintains its flow, is the rainfall.

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\* Abstract of a lecture delivered before the Franklin Institute, February 4th, 1887.



Whether as a gentle shower, or as silently-falling snow, or as a rain-storm, all precipitation of moisture has for its ultimate effect the production of a proper proportion of water for the growth of vegetation and for the use of mankind, and the quantity of water represented by a given rain- or snow-fall can be but imperfectly understood or appreciated. Calculations of the volume, weight, and power necessary to elevate the water will astonish an investigator, and it is my desire to present, if possible, some conception of the force thus represented.

No attempt will be made to estimate the power which condenses and holds one volume of oxygen and two volumes of hydrogen into a volume  $\frac{1}{1800}$  of the space which they fill as gases; for it is claimed that to reduce oxygen and hydrogen to the form of water a pressure of 40,000 pounds per square inch is required. And here we may refer to the fact that Faraday demonstrated that to decompose one drop of water required as much electricity as is contained in the thunder-bolt. We will, however, consider the power which is apparently more within our comprehension—namely, that of vaporization, which, while not changing the compound of the two gases, transforms water (which is heavier than air) into vesicles or vapor which is carried to great heights above the earth, and wafted by winds for thousands of miles over the surface of the globe. When we remember that by far the greatest amount of evaporation is near the equator, and that the ocean is the reservoir from which the rains are produced, we may form some idea of the work done, but a very inadequate conception of the power employed.

The presence of water in the atmosphere, which as a great gaseous sea, forms an envelope surrounding the globe, is appreciable in so many ways, that it is remarkable this presence is so often forgotten by us. The dew on the blade of grass, the frost on the window, the brilliant colors of the rainbow, the fog on the ocean, the mist in the valley, the majesty of the cloud bank, the rain, the hail, the snow, all are constant evidences that we exist in an atmosphere in which water is always present in appreciable amount, the quantity of water varying with location, surroundings, temperature, etc. The

general composition of the atmosphere is given in Miller's "Elements of Chemistry," as follows :

	<i>Volumes.</i>
Oxygen.....	20.61
Nitrogen....	77.95
Carbon dioxide.....	0.04
Aqueous vapor (average).....	1.40

It contains also traces of nitric acid, ammonia, and carburated hydrogen. The total weight of water in the atmosphere surrounding the earth is estimated to be 54,460,000,000,000 tons ; a weight of which we can form no conception, much less realize how it can be held in suspension, as it were ; for the air is a mixture and not a chemical compound, or a distinct substance like water. Professor Cooke, of Harvard, says : " We may regard the globe as surrounded by at least three separate atmospheres—one of oxygen, one of nitrogen, and one of aqueous vapor—all existing simultaneously in the same space, yet each entirely distinct from the other two, and only very slightly influenced by their presence. Oxygen and nitrogen cannot be reduced to liquids even by the intense cold of the poles. The slightest reduction of temperature, however, when the air is saturated with moisture, is sufficient to condense a portion of the vapor to water and to shower it in drops of rain. On the other hand, when the temperature rises, the heat converts more water into vapor, and the aqueous atmosphere is replenished. Thus it is that the atmosphere of aqueous vapor on the earth is liable to very great fluctuations, from which the Creator has protected the great mass of the air by endowing oxygen and nitrogen with the power of retaining the aeriform condition under all circumstances, and the fluctuation in the one case is as important as the stability in the other." \*

The presence of moisture in the air is made constantly manifest to the sense of sight, particularly by sudden changes of temperature ; but often there are circumstances which attract attention where the conditions are in whole or in part produced by artificial means. A very marked instance of this

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\* " Religion and Chemistry," p. 71.

was noticed in starting an iron works in New York State last winter, when the thermometer for a week seldom indicated a temperature above zero, and for days averaged— $10^{\circ}$ . When doors were opened and the cold dry air rushed into rooms which were warm and moist, clouds of vapor were produced, which filled the apartment as with steam, and such in reality it was. In several instances snow was the result. To prevent freezing, the machinery was kept in motion in advance of the requirements, and the air from the blowing-engine was allowed to escape through a safety-vent. When all was in readiness, it was found impossible to close this valve, owing to the ice, one inch in thickness, which had formed on it by the moisture in the air which passed through the blowing-engine, and came from a warm room, being condensed and congealed by the lower temperature of the outside air.

In Mr. Lorin Blodget's work on "*Climatology*," he states that, "for much the larger area of the United States, and for all portions east of the Rocky Mountains, the distinguishing feature of the atmospheric precipitation in rain is its *symmetry and uniformity in amount over large areas*. The quantity has rarely or never any positive relation to the configuration of the surface, which would identify it with the distribution of Western Europe and the North Pacific Coast; and, in contrast with these, it has a diminished quantity at the greater altitudes generally, and the greatest amounts in the districts near the sea level. It also differs from these districts, and from large land areas generally, in having a greater amount in the interior than on the coasts for the same latitudes, at least, as far north as the forty-second parallel of north latitude." \*

We must not interpret this extract too literally, for they are generalizations, and we cannot overlook many local influences which affect the rainfall. To a considerable extent, the position of the rain-gauge influences the quantity of precipitation measured, for series of careful records, taken at various localities, and covering considerable periods of time, indicate that the quantity entering the gauge diminishes irregularly with its height above the ground; probably on account of the

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\* "*Climatology of the United States*," p. 317.

greater wind velocity at the higher level. One authority asserts that, at a height of twenty feet, this decrease amounts to as much as ten per cent of the entire rainfall; and one exceptional case is recorded where the measured precipitation at an elevation of fifty feet was but forty per cent of that at the earth's surface. Our water department has attempted to construct a curve showing this decrease from its own observations, as well as from reported experiments; this curve demonstrates that at an elevation of forty feet above the ground eighty-seven per cent of the actual rainfall enters the gauge. Commenting upon the question, why there is less rainfall caught in gauges high above the ground than in those on the ground, Professor Cleveland Abbe, in his lecture in December last, upon "Popular Errors in Meteorology,"\* says: "There is really the same amount of rainfall at 100 or 50 feet altitude as on the ground; the fault is in our rain-gauge, which is exposed to stronger winds when set high up, and to almost no wind when flush with the ground. The stronger winds deflected around the gauge carry the drops to one side, and hence the higher gauge catches less than the lower one."

The variations are prominently shown in the annual report of the Philadelphia Water Department for 1885, in which the average recorded precipitations for the years 1883, 1884, and 1885 are given as follows: (The percentages refer to the United States Signal Station as a standard.)

United States Signal Station.....	37.25 inches, percentage 100
Philadelphia Water Department.....	35.29 " " 95
Pennsylvania Hospital.....	42.72 " " 115
Germantown.....	41.25 " " 111
West Chester.....	50.59 " " 136
Pottstown.....	44.52 " " 119
Reading.....	42.91 " " 115

There are other localities mentioned in the report, but I have selected those which are nearest to the city, and we will consider only the first three, which are within the limits of the city, and are taken where it is presumed all possible precautions against error are provided for. These three show a variation in the average, for the three years, of 6.43 inches of rain, and, if we select monthly records, the differences are

\* See *Journal of the Franklin Institute*, No. 123, p. 115.



even greater than the average, as the following will demonstrate: In August, 1885, the United States Signal Station reported 6.80 inches, the Water Department, 7.90, and the Pennsylvania Hospital, 10.08 inches, a difference between extremes of 3.28 inches. In the months where the rainfall is not so heavy as in August, the differences are scarcely less marked. Thus, the following are recorded:

*U. S. S. S. W. Dept. P. Hospital.*

November, 1884...	2.31	2.98	4.01,	a difference of 1.70 inches.
In October, 1885...	3.33	3.67	4.85,	" " 1.52 "
In December, 1884.	3.28	3.78	4.76,	" " 1.48 "

It is not my purpose to take up the subject of rainfall generally, although the topic for the lecture might possibly have given rise to such expectation. The purpose of the lecture would be better expressed by the more prolix title, "The Water which Falls upon and which is Required by the City of Philadelphia;" and we will now consider the first branch of the subject, which was suggested by the favor with which an article,\* entitled "Sun Pumping," prepared for one of our technical journals, was received.

THE WATER WHICH FALLS UPON PHILADELPHIA.

Have you ever thought of the volume or the weight of the water which is annually precipitated upon the area covered by the city in which we live; or even upon the quantity which falls upon a square mile or a square acre? If not, the amount will be a surprise, and, at the risk of appearing to treat the subject in an elementary manner, I will ask you to follow some calculations which will possibly give an idea of the volume of water, most of which the sewerage system of a great city must care for, the work done by the sun in elevating the weight to the cloud-level (if such a term is admissible), and the relation that the rain falling upon the city bears to the water supplied to it. Let us first consider the precipitation upon an acre and a square mile:

In a square acre there are.....43,560 square feet.

" " mile " (5,280 × 5,280) = 27,878,400 " "

\* *Iron Age.*

Therefore, each foot of rain which falls upon these areas is equivalent in volume to—

43,560 cubic feet, or 325,829 gallons of water per acre ; and  
27,878,400 “ “ “ 208,530,432 “ “ “ “ square mile.

Now, in round numbers, thirty-two cubic feet of water, under ordinary conditions and temperature, weigh one net ton (2000 pounds), and thirty-six cubic feet weigh one gross ton (2240 pounds). On this basis, the weight of water can be readily calculated ; however, as the usual method of reporting the rainfall is in inches and not in feet, we may first bring the above figures to this base.

For each inch in depth of rain, the figures per acre and per square mile are as follows :

<i>Volume.</i>	<i>Weight.</i>
Per acre, 3,630 cubic feet, or 27,152 gallons =	100·8 gross tons. [113·4 net tons.]
Per sq. mile, 2,323,200 cu. ft., or 17,377,536 gals. =	64,533½ gross tons. [72,600 net tons.]

On the authority of Chief Engineer and Surveyor, Mr. S. L. Smedley, the entire area covered by the city is  $129\cdot\frac{383}{1000}$  square miles, and if we multiply the volume and weight of water per square mile representing one inch of rainfall, by the area of the city, we have the following :

<i>Volume.</i>
300,582,586 cubic feet, or 2,248,357,740 gallons.
<i>Weight.</i>
8,349,516 gross tons, or 9,393,206 net tons.

This weight is only appreciable by comparing it with the quantities of materials with which we are familiar. During the year 1886 the anthracite coal district of Pennsylvania produced over 33,000,000 gross tons, a larger output than ever before ; and, as far as the product is concerned, the year was also the greatest in iron production—viz., 5,684,543 gross tons. But four inches of rain on the area within the corporate limits of the city of Philadelphia weigh as much as all of the anthracite coal mined last year in this State ; and one inch of rain upon this area represents a weight nearly fifty per cent greater than the total output of pig-iron in the United States in 1886. The wheat crop of the United States for 1886, estimated by the Department of Agriculture at Washington at

457,000,000 bushels, weighs about the same as one and one-quarter inches of rain on the area of this city.

From the means and extremes of rainfall, as observed at the Pennsylvania Hospital, we find that the annual average for fifty-seven years was 45.19 inches, or 3.766 feet. . . .

The weight and volume of the average amount of rain which annually falls on the city of Philadelphia is as follows :

*Volume.*

For the year, 13,580,327,043 cubic feet, or 101,603,286,282 gallons.

*Weight.*

377,314,640 gross tons, or 424,478,970 net tons.

In *Stahl und Eisen*, Professor Ehrenwerth estimates that the total annual coal production of the world approximates 400,000,000 tons (metric).

Therefore, if we accept Professor Ehrenwerth's figures as correct, the rain, which has fallen annually on the area of Philadelphia, has averaged over ninety-five per cent of the total coal output, at present, of the world.

Upon the assumption of a uniform distribution of the precipitation throughout the year, the daily average for the fifty-seven years under consideration would be :

*Volume.*

37,214,595 cubic feet, or 278,365,171 gallons.

*Weight.*

1,033,739 gross tons, or 1,162,956 net tons.

But the table (omitted) demonstrates that in the year 1867 as much as 61.135 inches of rain fell, which would increase the above amounts over thirty-five per cent, and that in the year 1834 but 33.24 inches of rain are reported, which is about seventy-three per cent of the average precipitation, and the figures, as above, for that year would be but seventy-three per cent of those given. It will be noted that the average rainfall occupies a point very nearly midway between the two extremes above given ; this mean between the extremes is 47.188 inches.

Similarly the maximum and minimum monthly precipitations indicate variations from these figures, but, for the present, we will consider only the minimum monthly rainfall to estimate a possible daily average from it, leaving the maximum to actually recorded severe rain-storms ; for the rainfall

has ranged from *nil* to 7.323 inches in a day. Taking the minimum monthly rainfall—viz., September, 0.249 inches, the daily average, on the assumption of uniform distribution throughout the month, is 0.0083 inches, which indicates that for any one month the minimum amount of water falling per day on the city of Philadelphia was :

*Volume.*

2,494,835 cubic feet, or 18,661,369 gallons.

*Weight.*

69,301 gross tons, or 77,963.5 net tons.

(or probably less than the evaporation from the area of the city in the same time).

To consider the maximum rainfall, we look up the records of severe rain-storms, and by reference to the Pennsylvania Hospital reports, we find that from and including the year 1840, there were twenty-seven days on which over three inches of rain fell. The greatest amount being 7.323 inches, which are reported as falling during the twenty-four hours in August, 1873; the next in August, 1867, with a record of 6.680 inches, and in August, 1860, 6.005 inches. On two consecutive days (the 22d and 23d) of September, 1882, 5.566 and 4.260 inches, respectively, fell, a total for the two days of 9.826 inches. Of the twenty-seven days, on which over three inches of rain fell, eleven were in August, four in June, three in October and September, two in April and November, and one each in January and July; the heaviest of these last two being a fall of four inches in January, 1875.

Most of the large precipitations above mentioned continued but for a portion of a day; in fact, many of the records mentioned are for precipitations lasting but part of a day. Some of these will be noted later.

If, for the purpose of forming an appreciation of the enormous quantity of water represented by one of these heavy downpours, we take the latest recorded one for a day—viz., August 4th, 1885, 4.46 inches, we find that it was equivalent (for the area of Philadelphia) to a

*Volume*

of 1,340,598,334 cubic feet, or 10,027,675,520 gallons, and

*Weight*

of 37,238,843 gross tons, or 41,893,698 net tons.



Or, to make the amount appreciable, such a storm as that mentioned, when less than four and one half inches of rain fell in a day, deposited on the area of Philadelphia a weight of water greater by over twelve per cent than the total amount of anthracite coal mined in 1886; and this weight of water represented more than half of the weight of the total crop in 1886 of corn, wheat, and oats.

The volume would be over one-fourth of that of the great storage dam proposed for the Croton Aqueduct at Quaker Bridge, to cost the city of New York \$7,000,000.

The automatic recording water-gauge, connected with the office of the Water Department, at Thirteenth and Spring Garden streets, shows that on the morning of November 18th last, 0.52 inches of rain fell in nine minutes; and a similar gauge, located at Doylestown, indicated, on August 3d, 1885, a fall of one and one half inches of rain in twenty minutes. It is unnecessary to follow calculations further to form a conception of the amount of water represented by such precipitation; but it will be interesting to note that a rainfall over the area of Philadelphia such as that recorded last November is equivalent to a flow of 290,000 cubic feet per second; which is 15,000 feet per second more than the reported average flow of water over the falls of Niagara.

If time permitted, we could follow the subject of the weight and volume of water which falls upon nearly 2000 square miles of drainage area of the Schuylkill River, of which but about forty per cent passes Fairmount Dam, giving an average daily flow for the river, at ordinary stages, of less than three times the average daily precipitation on the area of Philadelphia above determined.

It has been the desire to draw our minds to an appreciation of quantity and weight, and I would now ask that you follow me to a conception of the *power* represented by the rainfall upon the area of our city, or, if I may use the term, the "Horse-power employed in Sun Pumping," for as Guyot says in "Earth and Man:" . . . "The Sun, the great awakener of life, the king of Nature, shoots his burning rays every day athwart the waters. He causes the invisible vapors to rise, which, lighter than the air itself, unceasingly tend to soar into the atmosphere, filling it, and constituting within it another

atmosphere. In their ascending movement, they encounter the colder layers of the higher regions of the atmosphere, which perform the part of coolers. They are condensed in vesicles, that become visible under the form of clouds and fogs. Then borne along by the winds, whether invisible still or in the state of clouds, they spread themselves over the continents and fall in abundant rains upon the ground, which they fertilize. . . . To study the distribution of the rains and of the moisture on the surface of the globe, is to study the course of the winds, which are their carriers." \*

The power that is required to convert the water into vapor and lift it far above us can be but imperfectly understood ; but to form a conception, let us consider merely the elevation of the water to the cloud level. Professor Loomis, in his text-book on " Meteorology," gives the average height of the clouds as two miles ; we know that some of the clouds which drop their rain upon the earth are much lower than this, but we do not know how high the water was raised, nor how far it was carried before intercepted by the cooler stratum that made the vapor visible as cloud. Let us then assume the average height to which the water (which as rain falls on Philadelphia) is elevated to be 10,000 feet ; and, using the figures with which we have become somewhat familiar, attempt to estimate this power. If our estimate of height is excessive, it is capable of reduction by the decimal system to any amount required.

Hann is given as the authority for the statement that five tenths of the aqueous vapor is found within the stratum between the sea level and 6500 feet above it, and that nine tenths of the vapor is below 20,000 feet. . . .

This is referred to, that you may note a possible error in the assumption, but as we know that many of the lower strata of clouds are evanescent, and are dissipated by the sun's rays, while most of our rains come from clouds at a greater elevation, we will make the estimates on the assumption that all of the vapor which falls as rain has been raised to an average height of 10,000 feet ; for the object of these estimates is rather to form a conception of these forces of nature than to give absolutely exact figures.

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\* " Earth and Man," p. 130.

To make the estimates of power, let us use the familiar standard of 33,000 pounds raised one foot high per minute as one horse-power, and apply the formula :

Net tons per day  $\times$  2,000 lbs.  $\times$  10,000 feet  
 $\frac{\quad}{33,000 \text{ foot-pounds} \times 1,440 \text{ minutes}}$  equals the HP.  
 developed.

It is only the developed horse-power which we shall consider, and no allowances will be made for losses of any kind.

We, therefore, have the following figures to represent the horse-power to be developed in raising to a height of 10,000 feet the quantities of water represented by the precipitation of—

	<i>Horse-power.</i>
One inch of rain on one acre.....	47.7
“ “ “ “ “ square mile.....	30,555
“ “ “ “ “ 129,383 square miles (the area of Philadelphia).....	3,953,370
The average daily precipitation of the month of minimum rainfall (0.249 inches) on the area of Philadelphia.....	32,812.9
The average daily rainfall, calculated from the annual average (45.19 inches) on the area of Philadelphia.....	489,460
The maximum rainfall recored in twenty-four hours in fifty-seven years (7.323 inches) on the area of Philadelphia.....	28,950,524

To understand what these powers represent, we can best refer to the volume of the last census on manufactures, in which the total amount of steam and water-power employed in 85,923 establishments reporting was 3,410,837 horse-power, of which 2,185,458 horse-power was steam-power, and 1,225,379 horse-power was water-power. Therefore, if the census returns are considered to represent developed power, the entire manufacturing industry of the United States, as given by the census returns, has not sufficient power connected with it to raise in one day the water represented by one inch of rain on the area of Philadelphia, and the entire steam- and water-power, as reported in the census, could not, in working together for twenty-four hours, develop more than twelve per cent of what we have estimated as necessary to raise the 7.323 inches of rain which fell in one day over the area of Philadelphia to a height of 10,000 feet. To form an idea of the “sun-pumping” represented by a severe rain, such as above-mentioned, when 0.52 inches of rain fell in nine minutes ; we

find that to raise an equal amount in the same time to a height of 10,000 feet would require the development of 329,000,000 horse-power. Now, if we apply Fairbairn's formula of "one cubic foot falling twelve feet per second equal to one horse-power" to Niagara Falls, where 275,000 cubic feet per second fall 230 feet, we find that the entire power which this immense cataract could produce in nine hours would be scarcely sufficient to elevate to cloud-level the water which fell in the city of Philadelphia in the nine minutes above mentioned. In these general estimates, no allowances of any kind are made. I would offer one more comparison; at the western extreme of Lake Superior, close to the City of Duluth, the St. Louis River, a stream about double the volume of the Schuylkill River, falls in a distance equal to that from Manayunk to the Fairmount Dam, from a height 100 feet higher than the Roxborough hill to tide level. And yet, upon the basis of one cubic foot falling twelve feet per second, this magnificent but as yet undeveloped stream would supply but one fourth the power to raise the average daily rainfall on the area of the city.

We can form another idea as to what the rainfall upon the area of the city of Philadelphia amounts to, which will probably be even more satisfactory than the calculations as to horse-power. The usual method of rating pumping-engines is by the duty in pounds of water raised one foot high by the consumption of 100 pounds of coal; and although some tests have shown duties in excess of 100,000,000 foot-pounds, we shall consider that a sufficiently high basis for estimation, for it is much above the average work performed by the pumping-engines in the United States. If, therefore, we assume a duty of 100,000,000 foot-pounds, we will have for each gross ton of coal consumed 2,240,000,000 pounds of water raised one foot high. To elevate the water (which fell as rain) to the cloud-level, say 10,000 feet, the following amounts of coal would be consumed:

	<i>Gross Tons.</i>
One inch of rain on one acre.....	1.008
“ “ “ “ “ square mile.....	645.33
“ “ “ “ “ area of Philadelphia.....	83,495.
45.19 inches of rainfall on the area of Philadelphia (that is, the average for fifty-seven years).....	3,773,146.



That is, to raise the average amount of water, which has fallen annually upon the areas of the city of Philadelphia for the past fifty-seven years, would require the yearly consumption of 11.4 per cent of all the anthracite coal mined in 1886, using the most improved pumping machinery.

Or, on the assumption of the same rainfall in the anthracite region as at Philadelphia, one half of the total production of coal at the present mine development would be consumed in raising the water, which falls as rain upon the 470 square miles of the anthracite region.

I recognize that in all of the calculations presented, there are many possible sources of error, and would therefore again remind you that they are intended as comparative and not as absolute estimates ; their object being solely to present a conception, imperfect though it be, of the forces which are continually at work about us.

#### THE WATER WHICH IS SUPPLIED TO PHILADELPHIA.

No subject is of greater interest to each of us than the character and quantity of our water-supply, for on these depend largely our comfort, safety, and health. It is not essential that we should enlarge upon this, nor will I consider it necessary at the present time to refer to the chemical analyses which have from time to time been published. That it is not all that we desire, is too well recognized to need mention ; the presence of mud discoloring it, or the shortage in certain districts when heavy demands for fires, etc., have been made, are convincing proofs that an improvement is necessary ; but that it is as unsatisfactory as some have asserted need, on the other hand, scarcely be noticed. However, a subject of so much importance cannot be too thoroughly discussed ; but while we should look at it in all candor for the weak points, we should be equally frank in admitting the merits of the supply upon which we depend. Those of our citizens whose business calls them to various parts of our own country, or to foreign lands, and who have opportunities for observing the peculiarities of their own and foreign cities, cannot but agree that an absence of local pride seems to be pre-eminent among our citizens, and that we seldom or never " put our best foot

forward." We are too apt to display our disadvantages, and to make light of our advantages, and in no one thing is this more pronounced than in some of the statements concerning our water-supply which have obtained publicity. Several years ago our deficiencies in this line were heralded throughout the country to our disadvantage, until, as one familiar with water-supplies facetiously remarked, "we were drinking poison, and our pipes had so *shrunk* in diameter that the supply was both unhealthy and inefficient." That the case is not as bad as this is evident from the fact that, although the year just past was one of unusually large water consumption, and that during the season of the greatest demand there was a severe drought, few complaints of either the quality or quantity of water were heard. It is not my desire to be understood as asserting that we should not have a better water-supply; on the contrary, it should command the most earnest and immediate attention of our city authorities; but the wholesale condemnation of what we now have, and the dire predictions as to the future which are published, are beyond the truth, and some of them are apparently instigated in the interest of special schemes.

Familiarity with the Schuylkill and Delaware rivers, from which our supply of water is obtained, encourages one to appreciate their disadvantages; but the knowledge of their drainage areas, gained by tracing many of the various tributaries from their sources to their confluences with the rivers, and an intimate acquaintance with the industrial development of the region, permit me also to recognize their merits. No more reliable source of water-supply is obtainable than from a stream of considerable size, particularly if the water passes over rapids, or by falling over dams, etc., is exposed to aeration. But the otherwise available character of river water may, and in our case is, offset by deleterious drainage. This is particularly true of the Schuylkill River, from which over ninety per cent of our supply is obtained; but some of the deleterious drainage which enters into it, fortunately for us, neutralizes other objectionable features.

Without entering into details of the drainage of the Schuylkill River, we may follow it from its source, in the anthracite coal regions, where it becomes so strongly impregnated with

acid from the mines as to interfere with the life of fish, etc. ; but this same acid destroys the organic matter emanating from a populous district probably as far as Reading. In the neighborhood of Reading large tributaries draining a limestone formation enter the river, and so neutralize this acid that at Pottstown, forty miles above Philadelphia, the water which is supplied to that city from the river is comparatively unobjectionable. Below this point, Phoenixville, Norristown, and Conshohocken likewise obtain their water-supply from the river ; but they also add to its impurities a considerable amount, which would be greater still had they efficient sewage systems. The discoloration of the Schuylkill water (outside of the mill refuse, which could and should be largely prevented) comes principally from the streams which enter the river between Norristown and Pottstown, and which, while objectionable, is not positively injurious. The large volume of purer water brought to the river from tributaries below Norristown, and possibly the limestone streams in that vicinity, have a marked effect in the improvement of our water-supply as to potability. Our present water-supply is objectionable more from its mechanical than from its chemical impurities, and with proper methods for the prevention of objectionable matters entering the river, with ample settling capacity provided, with possibly aeration by mechanical means, our water-supply will continue to be above the average of that furnished to large cities. To-day there is much that is objectionable to our senses, as well as to investigation, which can be removed. But as the city grows the surrounding country will be more densely populated, the pollution of the stream being increased by the augmented population and industries, and it is probable that it would be much cheaper to construct a system of supply obtained from sources which can be more readily controlled from contamination than to attempt to maintain the purity of the river in the distant future. It is here that a study of the rainfall is essential to the determination of a suitable water-supply, and it will be necessary in providing for the future to select a source whose purity can be maintained, or to adopt a system which will prevent objectionable products from entering the water which is furnished to our citizens.

Those who heard or who have read the lecture delivered in this room by Dr. Leeds will remember that he laid great stress upon aeration of the water supplied to cities, and recommended the use of air-compressors to deliver the air under pressure, so as to take advantage of the solubility of oxygen.

He instances results which apparently sustain the statements as to the value of such oxidation, and the advantages of introducing the air under pressure, but if we admit all that is claimed, it is hardly probable that the method can be generally employed, particularly in works already established. He gives as a reason for the compressors which were purchased for the purpose not being employed at our various Philadelphia pumping-stations, that "At only one of them . . . has the process been applied—namely, at Belmont, the other mains being too leaky to permit of its being used." It would rather seem that the contours, followed by the lines of pumping-mains from the other works, were of necessity such as would not keep them free from traps in which the air can accumulate, and thus produce jars to destroy the pipes. One of the first rules of good pipe-laying is, wherever possible, to obviate air-traps, and the efforts of an engineer are to prevent the accumulation of air in the pipes after they are laid. We can, therefore, not expect that with our water-supply as at present arranged aeration, by means of compressors in connection with the pumping-mains, will be successful; their use would rather be attended with considerable risk to the pipe system. If the beneficial results from aeration can be maintained, and they are sufficient to command attention if but a portion of the organic matter is thus oxidized, it would appear that better and less risky methods of reaching the desired results would lie—

(1) In the direction of raising the water above the surface of the reservoirs, and allowing it to fall in cascades, thus exposing it to the air, and, at the same time, adding ornaments to the reservoirs.

(2) The idle compressors could be utilized by placing them near to or upon floats in the reservoirs and forcing the air under pressure into the water near the bottom; or,

(3) As the lift would be but a few feet, rotary pumps, similar to wrecking pumps, could be placed on floats and large



volumes of water be quickly raised so as to fall in thin cascades and permit of aeration.

Either of these suggestions would appear to be applicable to our existing system of water-supply, and free from the serious objection of air in the pipe system ; the disturbance of the water might, however, interfere with the settlement of matter held in suspension ; but as our reservoir capacity is insufficient to accomplish any real clarification, of which we have evidence to-day in the color of the water, this would at present be a minor objection. For large storage reservoirs, in which the development of organisms cause unpleasant tastes or odors, these methods may also be found efficacious.

The total amount of water supplied to the city of Philadelphia in the year 1885, as given in the published report of the Water Department, was 25,165,020,072 gallons, a daily average of 68,945,260 gallons. This amount was raised to an average elevation of 156.2 feet, and the work done was therefore 89,746,351,338 foot-pounds per day ; or, on the assumption of continuous work, 62,323,855 foot-pounds per minute, equal to 1889 horse-power continuously exerted.

Mr. John L. Ogden, Chief Engineer of the Water Department, states that during the year 1886 the minimum daily pumpage was 49,187,598 gallons, and the maximum 102,202,857 gallons, the average being 78,432,289 gallons per day. If the average height to which this was pumped was the same as in 1885, the increase would be 13.8 per cent, requiring the continuous development throughout the year of 2150 horse-power.

Our calculations show that the average precipitation on the area of Philadelphia was equal to a volume of 278,365,171 gallons daily, or about four times the average daily pumpage of last year. Therefore, if we could collect twenty-eight per cent of the water falling on the area of the city and store it, we would have an ample supply for our present requirements. But the collection of water, without storage, would not avail us, for we must provide for dry seasons, such as that which occurred last year, when from August 8th to October 26th, inclusive (eighty days), the Water Department gauge showed that but 1.578 inches of rain fell, which is equivalent to a deposition on the area of the city of 44,348,856 gallons per

day, or fifty-six and one half per cent of the average daily pumpage for the year, and probably less than the evaporation for eighty days.

The problem to be solved by our city authorities in securing a source of future water-supply is fortunately not a difficult one, for there are several available drainage areas from which a supply of potable water can be obtained, either of which are more than ample for the present requirements of the city. The problem is, rather, how far into the future shall we look, and for how much of posterity shall provision be made? Upon the solution of this will depend also the character of the works constructed, and their number.

The available sources are :

(1) The Schuylkill River, from which the water must be raised into the reservoirs by pumping, with the attendant constant expense of operating the machinery. To continue the use of this source, persistent precautions against pollution must be taken and provision for storage must be made.

(2) The Delaware River, by pumping from a point or points away from the influence of the city's sewage. This will require the continual expense of maintaining machinery, increased storage, and demand watchfulness against future pollution.

(3) Gravity supplies from one or more of the tributaries of the Schuylkill or Delaware rivers, or from the upper waters of the latter stream. Such supply will be dependent upon the rainfall upon the areas drained, the percentage of the precipitation lost by evaporation, infiltration, and absorption, and the storage capacity provided. While gravity supplies are generally more costly to construct than pumping works, they are less expensive to maintain, and the territory drained can be more readily controlled.

(4) Publicity has been given to a project (which will probably never mature) to construct an immense dam across the valley of the Schuylkill, above Manayunk, to act in the double capacity of a store reservoir for a supply of water, and for power. This plan would remove much of the objectionable drainage, by *wiping out of existence* a large proportion of the manufacturing industries and a considerable part of the town-sites along the river, and bring close to us the possible risk of

the failure of the dam. If the damage to industries, to private dwellings, the losses to business centring about the city, and the changes of railroad lines which this necessitates are considered in connection with the fact that much of the objectionable drainage would still exist, it will hardly meet popular favor.

When the arrangements for this lecture were made, it was expected that the recommendations of the Chief Engineer of the Water Department as to a future water-supply would have been made public. Such, however, is not the case, but I understand that they will shortly appear, and it would be discourteous to anticipate these recommendations; for those to whom have been entrusted the duty of determining what is best to be done are entitled to a careful consideration on our part of the problems which they have studied out with so much care. But having from boyhood taken a lively and continuous interest in the water-supply of our city, I will be pardoned for expressing the conviction, based upon a careful study of the subject, that Philadelphia will obtain the best and most reliable water-supply by gravitation from one or more of the tributaries of the Schuylkill and Delaware rivers, and in view of possible social or political disturbances, it would appear that for the future a supply which did not make the city dependent on one source only would be advisable. To have a proper control of the areas drained, they should be the property of the city, and such purchase would, in view of the rapid reduction of our forest area, be likely to prove a profitable investment. Much of the area drained by these tributaries is imperfectly adapted for agriculture, but if properly cared for could sustain valuable forests, which would assist in securing the collection of the water falling as rain, by making the springs perennial, and at the same time grow timber of value. Philadelphia should not only control her water-supply, but also the sources from which it is obtained. A great city maintaining a magnificent forest preserve, wherein tree culture could be carried on both practically and technically, having the double purpose of maintaining the purity of the water-supply and the growth of timber for profit would do much to popularize a much-neglected feature of State and national administration.

For whatever knowledge I may possess concerning the present or the future water-supply of the city, I am indebted to him to whom I also owe the credit of any educational facilities or personal advantages, and it was in assisting my father in the study of the requirements of the city that my interest in the subject originated.

It is, therefore, a great gratification to find that the results of the examinations, surveys, and estimates, made at a large outlay during late years, are so close to those made by him twenty years ago, at an expense of about \$5000. I regret that his life was not spared to allow him to appreciate this, or to have others recognize the fact that his conception of what Philadelphia needed was but a quarter of a century ahead of what the city must now have.

You may properly credit these statements to loyalty to the memory of my father, and I am proud to admit such fealty as influencing me. But I will ask those of you who may be interested in the subject to compare the results of reconnoissances on foot of the streams convenient to the city, the surveys, calculations, and estimates published by him in 1865,\* with similar data published as the results of examinations made, at a cost of \$80,000, with the most approved instruments, with the help of a large corps of assistants, and with the advantage of twenty years of progress to confirm the above statement.

Either of the subjects embraced in the topic of this lecture are sufficient for an entire evening, and they have been but imperfectly treated. But if the data presented will assist us to recognize how immensely beyond our conception are the forces of Nature, which are constantly about us; if what has been said helps any one to appreciate the omnipotence of the Creator, at whose bidding "there went up a mist from the earth and watered the whole face of the ground;" if any thought expressed may aid in securing for Philadelphia of to-day and the Philadelphia of the future such a water-supply as a great city deserves, or if any suggestion made will assist in securing your support to any honest endeavor to advance our city, your patience in listening to me will have been rewarded.—*From the Journal of the Franklin Institute.*

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\* "Report upon Future Water-Supply of Philadelphia." By Henry P. M. Birkinbine, Chief Engineer, 1865.



## ORGANIC CONTAMINATION OF SOILS.

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By J. F. EASTWOOD, A.M., Assistant in the Chemical Laboratory of the University of Michigan.

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IN 1885 Mr. Erwin F. Smith, at that time a student at the University of Michigan, and since connected with the Department of Agriculture at Washington, collected and published a series of tables for the purpose of showing the influence of a more or less perfect system of sewerage upon the death-rate of cities. These statistics were drawn from American and foreign sources, and appear to demonstrate that as the means are perfected by which contaminating matter is carried away in sewers, or otherwise disposed of, deaths from typhoid-fever and diphtheria decrease in frequency, with a corresponding lowering of the death-rate.\*

When the above data are taken in connection with the experiments of Dr. J. von Fodor,† of Buda-Pesth, and those at the Laboratory of the University of Michigan, under the direction of Dr. V. C. Vaughan, upon the saturation and subsequent permeability of soils to decomposing organic solutions, we must conclude that a highly contaminated soil may, and frequently does, communicate its influence to water-courses, and thereby furnish a nidus for disease germs. That impure water is not invariably poisonous may be inferred from the experience of Dr. C. McKee, U.S.A., published in the *New York Medical Journal* for November 3d, 1883, where it is stated that water containing large quantities of putrescent animal matter was used for two weeks by a garrison of eighty persons, men, women, and children, without deleterious effects.

The correct view is, doubtless, the one expressed by Professor Mallet in the annual report of the National Board of

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\* "Influence of Sewerage and Water-Supply on Death-Rate of Cities," by E. F. Smith, Annual Report of the Michigan State Board of Health, 1885.

† "Hygienische Untersuchungen Luft, Boden und Wasser," by Dr. J. von Fodor.

Health for 1882, in which he says: "While numerous facts go to support the belief that not to the effect of any chemical substances, but to the presence of living organisms, with their power of unlimited self-multiplication, we must, in all probability, look for an explanation of most, at any rate, of the mischief attributable to drinking water, it is of course possible that indirectly a large amount of organic matter in water may be more dangerous than a smaller quantity, as furnishing on a larger scale the conditions and suitable material for the development of noxious as well as harmless organisms."

Thus while it is not possible to say from chemical analyses alone that one sample of water is more wholesome than another, for the reason that the one containing the least amount of organic matter in solution may be the very one harboring the organisms of disease, it is possible for the chemist to say which of two waters would the more certainly furnish the more favorable conditions for the development of such germs. In many of our larger cities thorough inquiries have been instituted with respect to the purity of the water-supply, and the reports are seldom flattering. They refer to sewage as the most fruitful source of pollution.

If this be true the subject no longer concerns the city only, but is brought home to every town and village, and indeed to every household.

While it may be doubted whether matters are as bad as have been reported, from the fact that analyses are not always conducted with that attention to detail which insures accurate results, the fact remains that privy vaults and cesspools are a source of contamination, and that disastrous consequences have arisen by reason of their proximity to the water-supply.

With these conclusions indubitably proven, all who are interested in matters of public health will welcome any information, however circumscribed the area of inquiry, which throws light upon this important subject. And furthermore such work must be relied upon to speak authoritatively, in proportion to the skill and patience brought to its accomplishment.

In 1885 Mr. F. V. Broadbent,\* a student of the University of Michigan, under the direction of Dr. V. C. Vaughan, undertook some investigations upon the organic contami-

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\* Mr. Broadbent's work was not published.

nation of soil, but was unable to give to the matter the attention which it merited ; consequently it was thought desirable, in view of the value attached to precise data upon this subject, that the same line of work should be followed somewhat more at length. These considerations led me to select the subject of soil contamination for this work.

In order that there may be no misinterpretation of the somewhat unexpected results presented below, it is necessary that the conditions under which they were obtained should be thoroughly understood. These conditions involve locality, character of the soil and underlying formation, character of the season and time of year.

The vaults examined were all situated in the sixth ward of the city of Ann Arbor, and at an elevation above the river of about one hundred and twenty feet, and where the drift, judging from the wells, cannot be less than a hundred feet thick. The soil will be described in connection with the description of the vaults. The work was done during the exceptionally dry summer of 1886.

#### METHODS.

For the unoxidized nitrogen, Wanklyn's method was applied as follows : One kilogramme of the earth to be tested was weighed out and thoroughly shaken with 1000 c. c. hydrant water, in a glass-stoppered bottle ; 500 c. c. of the clear liquid were syphoned off for use. The data thus obtained were corrected by a blank analysis, conducted in the same way, except that hydrant water alone was used instead of water from the soil.

The nitrates were determined as described in the *Analyst* of November, 1885.

For nitrites, Griess's method was employed.

For chlorides the ordinary solution of argentic nitrate was used. It should contain .0001 grain of chlorine for each cubic centimetre of the solution.

The tables are made out in parts per million.

The first four determinations were made from soils taken on the same plane as the bottom of the vault, and extending north four metres. The object was to determine the extent of lateral contamination on this plane.

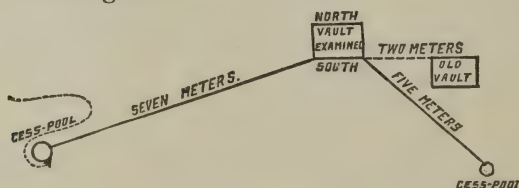
TABLE I.

	Distance from Vault.			
	1 Metre.	2 Metres.	3 Metres.	4 Metres.
Free ammonia.....	.024	.01	Trace	Trace
Albuminoid ammonia.....	.04	.026	.0096	.009
Nitrate.....	2.	Trace	0.	0.
Nitrite.....	.024	.04	Trace	Trace
Chlorine.....	2.2	.2	0.	0.

Moisture, 5 per cent.

The first series of observations was made upon a vault two and one half metres in depth; the first metre and a half through fine gravel, and the last metre into fine sand. It has been in use about four years by a family averaging five persons.

Its situation with respect to other sources of contamination is given in the diagram.



It may be seen from the above that all the elements of contamination practically disappear at the distance of three metres, and that the soil at this point has suffered no contamination from the vault.

TABLE II.

	Distance from Vault, 20 centimetres.				Distance from Vault, 120 centimetres.		
	2.5 m.	3. m.	3.5 m.	4. m.	2.5	3.	3.5
Free ammonia.....	.098	.012	.016	.006	.008	.008	Trace
Albuminoid ammonia.....	.444	.432	.43	.27	.09	.027	.027
Nitrate.....	4.	4.	Trace	1.	.3	.1	.1
Nitrite.....	.048	.012	.012	.008	Trace	Trace	Trace
Chlorine.....	28.	211.	6.	5.2	7.6	4.	3 6

Moisture, 5 per cent.

This table is the most instructive, as furnishing evidence of rapid decrease of the downward diffusion. At the depth of one metre below the bottom of the vault, the free ammonia has entirely disappeared, and the albuminoid ammonia is reduced to seven per cent of what was found on a level with the



bottom; the nitrates, to two and one half per cent; the nitrites to a trace, and the chlorides to nine per cent.

Seven analyses were made from soils taken on the north side of the excavation, beginning at the depth of two metres and a half, the depth of the vault, and extending downward one and a half metres below the plane of the bottom. The object was to obtain some data concerning downward diffusion. The first boring was at the distance of twenty centimetres from the vault, and the second, one metre from the first.

TABLE III.

	Depth, 2 metres.			
Distance from vault.....	.2	.6	I.	I.4
Free ammonia.....	.008	.002	.004	.003
Albuminoid ammonia.....	.035	.035	.004	.003
Nitrate.....	.1	.1	Trace	Trace
Nitrite.....	.012	.016	"	"
Chlorine.....	.06	0.	0.	0.

Moisture, 5 per cent.

The above analyses were made on a plane near the bottom of the vault, and on the side toward the other sources of contamination, for the purpose of noting the influence of the cess-pools and old vault. It is seen that the elements quite uniformly decrease, uninfluenced, as far as appears, for the short distance to which the soil was examined.

The second series of analyses was made from soils in the vicinity of a vault sunk two and a half metres into very compact clay. The privy had been in use five years.

TABLE IV.

	Distance, .5 metre.		Distance, 1 metre.		Distance, 1.5 metre.	
Depth....	2. m.	2.5	2.	2.5	2.	2.5
Free ammonia.....	.16	.04	0.	0.	0.	0.
Albuminoid ammonia.	0.4	.04	0.	.02	.02	.02
Nitrate.....	Trace	Trace	Trace	Trace	Trace	Trace
Nitrite.....	.04	.016	.008	.004	.008	.004
Chlorine .....	.02	.028	.02	.02	.0	.0

Moisture, 12 per cent.

On the plane of the bottom of the vault and at the distance of one metre there is substantially no pollution.

The third series was made from soils taken upon the east side of the vault of the medical building of the University of

Michigan. The privy has been in constant use for twenty years. The walls are of brick, and the bottom loosely overlaid with bricks. Its depth is about two metres. For the past five years it has been connected with the sewer. The soil is largely sand.

TABLE V.

	Distance, 2 metres.		Distance, 2.5 metres.		Distance, 3 metres.	
	2. m.	3. m.	2. m.	3. m.	2. m.	3. m.
Depth.....						
Free ammonia .....	.0	.0	.0	.0	.0	.0
Albuminoid ammonia..	.0129	.016	.016	.016	.016	.016
Nitrate .....	.25	Trace	.5	Trace	.25	Trace
Nitrite.....	Trace	"	Trace	"	Trace	"
Chlorine.....	.8	.07	.47	.4	.6	.32

Moisture, 3.5 per cent.

It would seem that no circumstances could be more favorable to show contamination if they existed. Here is a porous, sandy soil with a privy used by hundreds of students, and yet at a distance of three metres the soil is almost free from any form of nitrogenous matter.

The last vault examined is near the Dental Building of the University of Michigan. It is eight feet deep, with plank walls, and sunk into coarse gravel. In this case no other bottom than that of the soil had ever existed, and there is no connection with the sewer.

Because of sidewalk, it was necessary to begin at the distance of two metres.

TABLE VI.

	Distance, 2 metres.		Distance, 3 metres.		Distance, 4 metres.	
	2. m.	2.5	2.	2.5	2.	2.5
Depth.....						
Free ammonia .....	0.	0.	0.	0.	0.	0.
Albuminoid ammonia..	.02	.013	.01	0.	.015	0.
Nitrate .....	0.	0.	0.	0.	0.	0.
Nitrite .....	.004	Trace	.004	Trace	0.	Trace
Chlorine.....	0.	0.	0.	0.	0.	0.

The question now arises as to the meaning of these results. They are not in accord with the opinion held by many, nor indeed with my own before entering upon this work. I firmly believed that one privy vault was quite sufficient to contaminate the soil within the radius of twenty-five feet. And yet these analyses afford no basis for such an opinion. The four

independent lines of *investigation disprove* such an assumption. In view of these facts, I cannot escape the conviction that the soil is not contaminated to the extent supposed. It should be kept in mind, however, that these conclusions apply only to conditions such as were found to exist in this particular locality. It is equally certain that where impervious strata lie near the surface, the rain falling on the surface above will penetrate to this layer and follow its surface for a long distance, bearing with it contaminating matter.

In the first volume of Dr. Fodor's work, alluded to above, we have these words: "Frankland hat gefunden, das auf einen Sandboden von einem Quadratmeter Oberfläche und Mächtigkeit täglich 25 bis 33 Liter Londoner Canalwasser gegossen werden können, mit dem Ergebnisse, dass das abfließende Wasser ganz rein bleibt und das in diesem die aufgegossenen organischen Substanzen in der Gestalt von Oxydsalzen erscheinen."

From these and numerous experiments, it is evident that the soil possesses great retaining power for putrefying substances; nevertheless, a point may be reached when the soil becomes saturated and transmits what it receives.

In old and densely populated cities this point is soon reached, and its contamination communicated to the water. General reservoirs thus become cultures for micro-organisms and disease results. When sewers are introduced the soil quickly purifies itself, and the death-rate falls.

Again, what shall be said of the large number of analyses made in various parts of the country, and read at our sanitary conventions, by which wells, in nine cases out of ten, are pronounced dangerous? I have before me records of seventy-six analyses of this kind, and of this number only two report nitrites quantitatively determined, and not one nitrates.

Upon this point I cannot do better than quote Professor Mallet: "No strongly marked generic difference is presented by the results from any of the processes for the estimation of organic matter or its elements, between the generally wholesome waters of class one, and the medicinally condemned and fairly assumed pernicious waters of class two." The above is put in italics on page 200 of the Annual Report of the National Board of Health, Washington, 1882. The classes referred to are defined on page 190, same volume, to be class

one, "Natural waters believed to be good;" class two, "Natural waters which there seems fair grounds for believing have actually caused disease."

But on the other hand with respect to the nitrates and nitrites, Professor Mallet says further, pages 101 and 102: "Here we find a very obvious connection between the results of chemical examination and the known sanitary character of the several waters, the salts of nitrous and nitric acids being either absent or present in but trifling amount in the waters of class one, almost universally present and often in large quantities in the pernicious waters of class two, and variable in doubtful waters." \*

And yet these nitrates and nitrites are the very elements which are either not mentioned at all, or as being "some," "a trace," "not any." It appears to me scarcely necessary to say that such analyses should be received with much allowance.

To analyze the water of a well and pronounce it unclean is an easy task, but to affirm, as many of these papers unhesitatingly do, that this condition is due to privy vaults or cesspools in the neighborhood is altogether another thing. For instance, a well near my own house was condemned as harmful, and consequently abandoned. A few years before the analysis the fungi began to grow upon the wall from the top to the distance of ten or twenty feet down, and every bucket of water contained hundreds of small fungi or fragments, and if the bucket was allowed to go to the bottom, came up with so much sediment that it was necessary to allow the water to stand for some time before it became clear. Again, on a certain occasion, the bucket was lost in the well, and while endeavoring to get it out several old hats were obtained. Is there any more reason for supposing that the contamination which the analyses showed came from the vaults than from the fungi, old hats, etc.?

To determine whether a vault or cesspool contaminates a well, let the well be thoroughly cleaned, and if its water shows nitrites, nitrates, and chlorides, let it be condemned.

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\* "Water-Supply of Howell," by J. A. Wessenger, M.D. (16 analyses). "West Bay City Water Works" (3 analyses). "Water Supply of Hillsdale," by L. A. Goodrich, Ph.C. (8 analyses). "Water Supply of Ypsilanti," by J. H. Shepard (10 analyses). "Chemical Analyses of Potable Water," by W. G. Tucker, Ph.B., Albany, N. Y. (39 analyses).



## THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

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*(Continued from page 19.)*

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II. *Water Supply.*—Pure water, pure air, and pure soil are the three great essentials of healthy life. From earliest history they have been recognized as such. Moses smiting the rock depicts not merely the allaying of temporary thirst, but from what we are taught of the great lawgiver's sanitary wisdom, it was the giving to the people a living and pure water, undefiled by standing or stagnation, of a saving character in itself, as well as typical of the spiritual draught of which those that drink shall never die. As will hereafter be shown, this device has been employed wholly allegorically, just as Aaron's rod has been represented upon Jewish coins, and a fountain upon Temperance medals.

The ancient Romans were especially careful about the water supply of the Eternal City, and of those in their colonies. There were three pieces struck by the Marcia Gens, which refer to the construction of the aqueduct bearing their name.

85. Obverse. Filleted head of King Ancus Marcius to right. Behind, an augur's staff. Inscription : Ancus. Reverse. An equestrian statue, above the arches of an aqueduct. Beneath the horse's forefeet, a bush. Between the arches, A-Q-V-A-MR in monogram. The latter is repeated in the exergue : MAR in monogram. Inscription : Philippus, facing outward. A denarius. Silver.

Riccio. "Le Monete delle antiche famiglie di Roma," Naples, 1843, 4<sup>o</sup>, p. 139.

86. The second is a very similar denarius, recognized by Morelli as distinct from the preceding, that had been formerly considered one of the Trajans mentioned below.

Riccio, p. 139, pl. XXX., no. 14.

There is a third, a beautiful medallion, which was unknown to Riccio.

87. Obverse as preceding. Reverse. A double triumphal arch, surmounted by six statues. The arches of both tiers are evidently intended to represent those of the aqueduct. In exergue, Trionfale. Bronze. 32. 50 mill. My description is taken directly from a specimen in the cabinet of Mr. W. S. Sisson, of Portsmouth, R. I.

88, 89, 90. There are three medals of the Emperor Trajan, of about A.D. 107, which commemorate the restoration of the Marcian aqueduct. They bear Aqua Trajana, with the device of a flowing stream. Bronze.

Birago. "*Imperatorum Romanorum Numismata*," Milan, 1730, fol. ; pp. 157, 161.

91. Another of the same emperor, with the device of a reclining river-god, bears Aqua Campana. A specimen was in the Frossard sixty-ninth sale, May 24th-25th, 1887, no. 482.

The above are all illustrations of bringing potable water to a city. The medals bearing upon conveying water away from a place will be described under Section V. of the present paper, "Drainage."

In modern times there are three medical medallists who have written upon or otherwise had to do with this topic. They are the following :

#### A. THE UNITED STATES.

Dr. J. M. Toner, of Washington. "*Water Supply of Cities, etc., etc.*," Cambridge, 1876.

Dr. Toner's medals have already been described under Section I. He will be again referred to in Sections VII., Ventilation ; X., Inoculation, Vaccination, Cholera, Yellow-Fever, and Syphilis ; XI., Military and Naval Hygiene ; XII., Climate ; and XIII., Registration.

#### B. THE NETHERLANDS.

J. H. Van Swinden, of Amsterdam. "*Rain Water, Cistern Water, and that transported by Vessels.*" Transactions of Public Health Commission, etc.

The medals of Van Swinden were described in Section I. He will again be alluded to under Sections V., Drainage ; VI., Sewerage ; X., Epidemics ; and XIII., Registration.

C. GERMANY.

Dr. Johann Jakob Baier, of Altorf (1677-1735). The donor of a fountain or water works to his city, as is stated by Gaetani.

92. Obverse. Bust to right. Beneath, Werner, F. Inscription : D.I.I.Baier P.P.Altorf.Et Acad.Nat.Cur.Praes. Reverse. A flowing fountain, with two tiers of jets. Legend : Non Sibi Sed Publico. Exergue : De Obtento Praesid. | Acad.Imper.Gratul. | F.F.A.E.B. (Fieri Fecit Andreas Elias Buchner.) | 1730. Lead. Tin. 3 centim. Kluyskens has a dot after Baier upon obverse. Gaetani has Altdorf, & in place of Et, and Westner upon obverse, and on reverse Ostento, and the date in Roman numerals.

Gaetani, p. 284, pl. CLXIX., no. 1.

Will. "Der Nürnbergischen Münzbelustigungen," i., p. 209.

Altorf. "Der Nürnberg. Universität Altdorf Denkwürdigkeiten von Münzen, etc.," pl. VI., fig. 3.

Rudolphi, p. 7, No. 28.

Duisburg, p. 120, CCCXXI., no. 1.

Kluyskens, i., p. 40.

An engraving of the above exists in the collection of medical portraits at the Library of the Surgeon-General's Office at Washington. This medal commemorates the contribution to Altorf's water supply mentioned above, and not merely, as has been thought by some, the many-sided learning of the man. Dr. Von Büchner, who caused the medal to be struck in behalf of the Academy "Naturae Curiosorum," was, like Baier, a president of that body. He was also himself a medallist.

93. Obverse. Bust. Beneath, Dorsch. Inscription : I.Iac.Baierus Med.P.P.Acad.H.T.Rector. Reverse. { Ex Gemma C. Dorschii 1723 Scalpta R.C.I.C.V.Moehsen. in engraved letters. Cast tin. Silver. 4.5 centim. Rudolphi and Kluyskens have a dot after the date.

Altorf, pl. VIII., fig. 8.

Rudolphi, p. 7, No. 29.

Duisburg, p. 121, CCCXXI., no. 2.

Kluyskens, i., p. 40.

Dr. J. C. W. Moehsen, of Berlin, who superintended the cutting of this medal, was Physician to the King of Prussia, and a member of the Royal Public Health Commission.

94. In the Library of the United States Surgeon-General's Office there is an engraving of a third medal of this Dr. Baier, which I fail to find described. It represents him with his father, who is given in the inscription as Joh. Guil. Baier G.D.R. 1672. This indicates a date five years previous to the birth of J. J. Baier. The latter is to be distinguished from his son, F. J. (Ferdinand Jakob, 1707-88), of Nuremberg, and from the second J. J. B. (1724-1800), also of Nuremberg, a writer on Forensic Medicine. Dr. Baier will be again referred to in Section XIII., Registration.

The medals directly illustrative of the present Section are the following :

#### A. THE UNITED STATES.

95. Obverse. View, crosswise, of an aqueduct. Upon its base, Croton Aqueduct | Length 41 M. Within it, Discharge | In 24 Hours | 60,000 000 Galls etc. Descent | 13 $\frac{1}{4}$  Inches Pr Mile Above, Built By The City Of New York. Commenced A.D. 1837. | Water Introduced 4<sup>th</sup> July, 1842. Reverse, View of the city of New York, and in foreground the old reservoir. Upon the water within, 114 Feet etc. | Above Tide etc. Upon the side, R. Lovett. Below, Distributing Reservoir. | Cap(acity). Dis. Res. 21 000 000 Gall<sup>s</sup> | Cap. Rec. Res. 150 000 000 Gall<sup>s</sup> | Croton Lake Reservoir | Available Capacity | 300 000 000 Gall<sup>s</sup>. Bronze. Gilt copper. White metal. 32.

96. Obverse. A laureated river-god, seated, with rudder and flowing urn. Inscription : Nassau Water Works | Commenced July | 1856. Reverse. The pumping works. Inscription : Water Introduced In The City Of Brooklyn | December 1858 | Celebrated April | 1859. Silver. Copper. White metal. 22. Fonrobert (Nord-Amerika), No. 2736.

This is in my collection.

97. Obverse. William | Knapp | Artesian | .\*. | Well | .\*.



| Driller | Rockford, Ill. Reverse. Liberty Head (etc.)  
1864. Copper.

Fonrobert (Nord-Amerika), No. 1625.

98. Obverse. Water-works adorned with figures. Inscription: Davidson-Fountain | Patent Pending. Reverse. To The | People | Of | Cincinnati | 1871. | Tyler-Henry | Davidson. Probasco. Tin. 17.

Fonrobert (Nord-Amerika), No. 3932.

Whether the individual herewith made historical is the one to medical men identified with the "fountain syringe," I am not informed.

99. Centennial Fountain, Phil<sup>a</sup>, 1876.

As this is also allegorical, it may therefore be again classed with Temperance medals, in Section VIII., Diet.

#### B. ENGLAND.

100. Victoria Fountain. Brighton. Bronze. 26.

A specimen of this was at the Strobridge sale, December 14th-16th, 1874, No. 732.

#### C. THE NETHERLANDS.

101. Obverse. Coat-of-Arms. Aquae Ductvs.Bruxell.  
16-39. Reverse. St. Michael, with the scales of justice.  
Legend: .Ingenio.Et.Probitate. Silver. Bronze.

Neumann, No. 35, 125. See also *Ibid.*, Nos. 34, 610-11.

This was a family jeton of Fridrik de Marselaere, later Baron Van Parck, who was Burgomaster, Sheriff, and Superintendent of Canals at Brussels. I have received from M. Alphonse de Witte of that city a detailed history of this interesting jeton, and only regret that I have not space to reproduce it here.

102. Fountain at Ypres. 1689-92.—*Revue Belge de Numismatique*, Jan., 1887, p. 39.

102<sup>a</sup>. Fountain at Leyden. 1693.

#### D. FRANCE.

103. Roubaix and Tourcoing. Introduction of the water of the Lys, 1863. Bronze. 52 mill.

Tarlier Catalogue, Paris, 1879, no. 422.

104. Similar to last, but smaller.

*Ibid.*, no. 423.

## E. AUSTRIA.

105. Obverse. Laureated bust, mailed, to right. Beneath shoulder, Vestner.F. Inscription: Carolvs VI.D.G.Rom. Imp.S.A.Germ.Hisp.Hvng.& Boh.Rex. Reverse. Columnna | Quam S.S.Trinita | ti | Civit : Aqvae Con- | tagione Liberata | Ex Voto Posvit | Primvm Lapidem Debet | Pietati Avg : Imp : Caes : Car : VI. | Ger.His.Hv.Bo.Reg : | Ar : MDCCXIV | 3.Ivn : Silver.

Pfeiffer and Ruland. "Pestilentia in Nummis," 1882, p. 120, No. 357.

Commemorative of the water supply at Baden, near Vienna, being freed from supposed infection, on the cessation of the Plague in 1714.

106. Similar to the above, save that on reverse Trinitati closes the second line, Aqvae the third, and the last line reads Die III Junii.

*Ibid.*, p. 121, No. 358.

These two medals will be again referred to in Section X., Epidemics.

107. Ferdinand Aqueduct at Vienna. 1840.

108. Schwanthaler Fountain at Vienna. 1846. By Lange. Silver. Bronze. 49 mill.

## F. SPAIN.

109. The regular coinage of the city of Segovia, the mint-mark of which was a section of an aqueduct. There exist also the two following medals of this city.

110. Obverse. Arms in circle, 1833. Reverse. Four-arched aqueduct (Segovia Arms). Copper. Low fifteenth catalogue, May 9th, 1887, no. 577.

111. Obverse. Arms in Shield, 1843. Reverse. Three-arched aqueduct (Segovia Arms). Silver. Copper.

*Ibid.*, no. 578.

112. Obverse. The arms of the city of Havana (Cuba). A crowned shield, surmounted by Neptune in quadriga drawn by spouting sea-horses. Reverse. An inscription of twenty-three lines, with names of Captain-General Concha and others. Bronze. Oval, of varying size, from 33 x 36 (Frossard forty-second sale, April 10th, 1885, no. 518) to 39 x 44 (Frossard sixteenth, October 21st-22d, 1880, no. 1420).

Upon the occasion of opening the Havana Water Works in 1858.

G. THE STATES OF THE CHURCH.

1530. Pope Clement VII.

113. Vt. Bibat. Popvlvs. Moses striking the rock. By Benvenuto Cellini.

Bonanni. "Numismata Pontificum Romanorum," Rome, 1699, fol.; i., pp. 185, 192, fig. 10.

Armand, i., p. 148, No. 8.

To commemorate the construction of an enormous well, from the bottom of which horses, mules, and asses with casks of water could ascend by a spiral staircase.

114. The device is similar to that upon the large medal of Padre Giovanni Niccolò Barinti, of Civita Vecchia, a priest of the Congregation of the Oratory, who was entitled "Sacrae Eloquentiae Flumen." It was struck in 1706, and above the flowing rock is the inscription, Et Fluxerunt Aquae. It is figured by Gaetani (ii., p. 268, pl. CLXIV., no. 2).

1534. Pope Julius III.

115. Fons. Virginis. | Villae. Jvliae.

Bonanni, i., pp. 243, 255, fig. 24.

Venuti. "Numismata Romanorum Pontificum praestantiora," Rome, 1744, 4°, No. xv.

This is in my collection. It was struck upon the Restoration of the Claudian Aqueduct.

1563. Pope Pius IV.

116. Aqua. Pia.

Bonanni, i., pp. 271, 278, fig. 16.

Venuti, No. XXIV.

Upon the construction of a fountain in connection with the Claudian Aqueduct.

117. The same legend, but with a different device.

Bonanni, i., pp. 271, 278, fig. 17.

1609. Pope Paul V.

118. A section of the Aqueduct. Pvbl. Comod. Restitvit.

*Ibid.*, ii., pp. 505, 532, fig. 27.

Venuti, No. XVII.

Construction of aqueduct for the Aqua Paula.

119. The same device. Pvbl. Comodit. Restitvit.

M. DC. IX.

Bonanni, ii., pp. 505, 532, fig. 28.

Venuti, No. XVIII.

This is in my collection.

1610.

120. View of fountain. Pvblicae comoditati. | M.D.C.X.

Bonanni, ii., pp. 505, 534, fig. 29.

1652. Pope Innocent X.

121. View of fountain and obelisk. Ablvto.Aqva.—Virgine. | Agonalivm.Crvore.

*Ibid.*, ii., pp. 615, 634, fig. 26.

Venuti, No. XVI.

Upon construction of a fountain. It is in my collection.

122. The fountain alone. Inscription the same.

*Ibid.*, ii., pp. 615, 634, fig. 27.

1703. Pope Clement XI.

123. The aqueduct, etc., of Civita Vecchia. Haurietis Cum Gaudio. (In Gaudio, Van Peteghem Catalogue, Paris, June 15th-17th, 1881, no. 76.)

Venuti, no. XVI.

Rivoire. "Histoire Métallique de l'Europe," Lyon, 1767, 8°, p. 285, no. 305.

1713.

124. The fountain of the Rotunda. Fontis Et Fori Ornamentum. A silver scudo.

Scilla, p. 125.

125. Similar to the last, but from different dies. Also a scudo.

*Ibid.*, p. 299.

1724. Pope Benedict XIII.

126. Havrietis.In.Gavdio.De.Fontib.Sal.Ivbilei. See No. 123.

Sambon, "Catalogo della collezione Cavriani," Milan, 1887, No. 2160.

1736. Pope Clement XII.

127. View of a fountain. Fonte.Aqvae.Virginis.Ornato. | MDCCXXXVI. Beneath, Romulus and Remus suckling the she-wolf. Also O.H. (Ottavio Hamerani).

Venuti, no. VII.

Rivoire, p. 291, no. 365.—This is in my collection.

1841. Pope Gregory XVI.



128. Dvctvs. Aquae. Clavdiae. Dilapsis. Partibvs. Refectis.  
Van Peteghem Cat., Paris, June 15th-17th, 1881, nos. 205-6.  
Anthon Cat., Part II., no. 1844.  
Upon the Restoration of the Claudian Aqueduct.  
129. Improvement of Tiber, and Water Works.  
Frossard fifty-ninth cat., November 23d-24th, 1886, no. 439.

Again : Medals and tokens have been struck relative to the purification of water, and its mechanical management within dwellings, or plumbing. As an instance of the latter, the Davidson medal, already described, No. 98, might be cited. Before speaking of those relating to its purification, mention should be made of a distinguished medallist, the late Dr. Charles Thomas Jackson, of Boston, of Ether fame, who wrote the following : " Essay on Lead Pipes used as conduits for drinking-water, contrasted with pure block-tin pipes," New York, 1852, 8°.

130. Obverse. Oscar Rex Sueciae Norvegiae Goth. Et Vandal. L. N. Dundoren F. Reverse. Jackson Med. Doctor. Bostonii. Amer. Sept. A crown under wreath within circle. Illis Quorum Meruere Labores. Gold. 27.

This medal was presented to Dr. Jackson by the King of Sweden, for his part in the discovery of artificial anæsthesia. Copies in lead and gilt electrotype are in the Lee Collection. It was unknown to Kluyskens, Duisburg, and Rüppell.

There are several tokens regarding water purification.

(a) *London.*

131. Obverse. A filtering apparatus. For Purifying Water. Exergue : 1795. Reverse. The Filtering-Stone Ware-House. In field, Coventry | Street | London. Edges beaded.

Neumann, No. 23, 120.—This is in my collection.

(b) *Edinburgh.*

132. Obverse as above. Exergue : 1796. Between two eight-leaved thistles a heart-shaped shield, suspended by a ribbon, with a two-leaved bunch of grapes. Issued By H. Harrison.

*Ibid.*, No. 24, 607.

(c) *Paris.*

133. Obverse. In field, \* | Cuchet | Et | Comp<sup>ie</sup>. Beneath, an oak twig with two acorns. Établissement Du Terrain. Reverse. Eau Clarifiée Et Depurée. In field, Dix | Voies | <> | 1807. (The voie was about two pailfuls.)

*Ibid.*, No. 31, 419.

134. Établissement Créé En 1807. In field, \* Cloitre | Notre Dame. Beneath, two little vases with handles. Reverse as preceding, save Une | Voie | <> | 1809.

*Ibid.*, No. 31, 420.

135. As above, but Deux | Voies.

Van Peteghem Numismatic Catalogue, Paris, 1874, No. 782.

136. As above, save in field of obverse, within a wreath of leaves. 10 | Voies, and in field of reverse, Dix | Voies | <> | 1811.

Neumann, No. 31, 421.

137. Obverse. Compagnie Française De Filtrage. In field, Conseils. Reverse. Female seated. (1837.) Silver. Octagonal. 35 mill.

Otto Helbing Catalogue, No. 3, Munich, 1887, No. 644.

138. Ile Saint-Louis. 10 Voies Eau Froide. (1839.)

Van Peteghem Numismatic Catalogue, Paris, 1874, No. 784.

III. *Bathing*.—As in illustration of the ancient medals relating to bathing, I cite the two following of Alexander Severus :

139. The hot baths constructed by Severus at Rome. Inscription : Thermae Alexandrinae. Gold. Silver. Bronze.

Vaillant. "Numismata Imperatorum Romanorum," Amsterdam, 1696, 4°, p. 299.

Donaldson. "Architectura numismatica," London, 1859, 8°, p. 279, fig. 274.

140. Nymphaeum Alexandrinum.

*Ibid.*, p. 270, fig. 73.

141. Leander swimming the Hellespont, with Hero holding a light from her tower. Above them, a winged Genius with a torch.

Sestini. "Descrizione di Molte Medaglie Antiche Greche Esistenti in più musei," Florence, 1832, 4°, p. 39, pl. VII., fig. 1.

This is a bronze medal of Caracalla, struck in the city of Sestos in the Thracian Chersonesus. I include it, as cold water is recognized treatment for the ardor of love, preventive as well as cure.

Of scientific writers upon bathing, I know of but a single one who is a medallist, and he originally of

#### A. THE UNITED STATES.

Benjamin Thompson, Count Rumford (1753-1814). "On the Salubrity of Warm Bathing."

Medals to Rumford have been struck by the Royal Society of London, and the American Academy of Arts and Sciences, at Boston, Mass.

142. Obverse. Tripod with flame. Noscere Quae Vis Et Cavssa (*sic*). [From Lucretius, "De Rerum Naturâ," Book V., verse 773.] Reverse. Branches of laurel, tied with ribbon, about a circle. Within, Praemivm | Optime Merenti | Ex Institvto | Benj. A. (von) Rvmford | S. R. I. (Sacri Romani Imperii) Comititis | Adjvdicatvm | A | Reg Soc Lond. The peculiar spelling of Causa upon the obverse will be noticed. Instances of such lapses are not uncommon upon the medals of the most learned societies. Gold. 75 mill.

Weld. "History of the Royal Society," London, 1848, p. 219.

Ellis. "Memoir of Sir Benjamin Thompson, Count Rumford," Boston (no date, 1872 ?), p. 245, fig.

This was the earlier of the two Rumford Medals of the Royal Society of London. It was unknown to Kluyskens and Duisburg, as well as to Rüppell.

143. Obverse. Head to left. At neck, Ch. Wiener. Inscription : Benjamin Ab Rvmford S. Rom. Imp. Comes Instituit. Beneath, MDCCXCVI. Reverse. Within a wreath of laurel and oak, tied with ribbon, Optime | In Lvcis | Calorisqve | Natvra Exqvirenda | Merenti | Adjvdicat | Soc. Reg. | Lond. Rüppell gives the date in Arabic numerals. Gold. Tin. 35 lines.

Rüppell, 1876, p. 80.

Ellis, p. 249, fig.

*American Journal of Numismatics*, July, 1872, fig.

The above medal, though struck by the Royal Society of London, was unknown to Weld, its historiographer, so that it must have been substituted for that previously described, perhaps for the misspelling, subsequently to 1848. Dr. Rüppell, of Frankfort-on-the-Main, who speaks of Rumford as "an English peer," possessed a copy in tin. He, upon the other hand, was unaware of the existence of the first. It was unknown to Kluyskens and Duisburg. The head upon the medal is from a portrait of Rumford painted at Munich, which hung in his house at Brompton, and was presented to the Royal Society by his daughter in December, 1831.

144. Obverse. Bust to left, with military coat and star. Beneath, Furst. Inscription: \* Benjamin Count Rumford \* Born 1753, Died 1814. Reverse. Rumford Medal For Discoveries In Light Or Heat | Awarded | By The | American Academy | Of | Arts And Sciences | To-Gold and silver, awarded together, to the value of \$300. Bronze. 40.

This, like almost all other American medals, was unknown to Kluyskens, Duisburg, and Rüppell. It is in the Lee Collection in bronze. Rumford will be hereafter mentioned in Sections VII., Ventilation; VIII., Diet; and XII., Climate.

Of modern medals and tokens relating to bathing, omitting the medal of George III., in 1725, upon the Order of the Bath, as but remotely connected with our subject, there may be mentioned:

#### A. THE UNITED STATES.

145. Obverse. A naked woman just emerging from a stream. Reverse. Between rosettes, Becks | Public Baths. In field, between larger rosettes, Richmond (Va.). Edges beaded. Silver. Copper. 18.

Neumann, No. 21,893.

I have this rare and beautiful token, in both the metals indicated.

146. Rector Bath House. Good For One Bath. Vulcanite. 21.

I am in doubt as to the locality where this was issued. It was in the Woodward twenty-fifth sale, December 16th-19th, 1879, No. 2545.



As an aid in bathing, there is the following druggist's token :  
147. Agua De Florida. W<sup>m</sup> Rust, N. Y. Vulcanite. 21.  
This is in my collection.

B. ENGLAND.

(a) *Bristol, Somersetshire.*

148. Obverse. Renison's Grand Pleasure Bath Bristol. In field, 1764, with floral ornament above and below. Reverse. Lady's Private Bath and Fountains\* . Within a border of flowers,  $\frac{d}{2}$ . Above, a scroll.

Neumann, No. 27,254.

To this very rare twopenny token I alluded in my paper upon obstetrical and gynæcological medals (*New England Medical Monthly*, December, 1886, No. 38).

There are several tokens, both English and French, having especial relation to sea-bathing. Of these are :

(b) *Eastbourne, Sussex.*

149. Obverse. The front of a two-storied building. Fisher's Library | And | Lounge | 1796. Reverse. Prosperity | To The | Gentry | Who Visit | East-Bourn. Above and below, a quatrefoil. Upon rim, Celebrated For Pure Air and Sea Bathing.+.+.

Neumann, No. 24,037.

150. A second variety has a rift of the die through the date and the L in Lounge.

*Ibid.*, No. 24,038.

151. There is a mule\* of the Princess Of Wales halfpenny token of 1795, with reverse of the London Corresponding Society, in which the rim has the Eastbourne stamp as above, except that through careless cutting the last two words are rendered Sea Sathing.

*Ibid.*, No. 39,637.

(c) *Leeds, Yorkshire.*

152. Obverse. Leeds | Waterloo | Swimming | Bath. Reverse. S. Hiron's card, Birmingham.

*Ibid.*, No. 27,529.

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\* A combination of an obverse or reverse, with a reverse or obverse that does not legitimately belong with it.

(d) *Lowestoft, Suffolk.*

153. Obverse. The sea-shore, with three vessels in the offing. In front, two bathing cars. Above, upon a triple bow, Lowestoft Token. In exergue, below a triple bow, R P within a circle ; near which, Sea-Bath | 17-95. Reverse. Four men in a boat draw a net. In background two vessels ; near which several sea-birds. Above, upon a triple bow, Success To The | Fisheries, which last word is below a triple bow. Neumann wrongly inserts upon obverse a dot between Lowestoft and Token. Rim milled.

*Ibid.*, No. 23,985.

This is in my collection. In the Woodward ninety-third sale, February 1st-2d, 1887, the Lowestoft token, of penny size, was catalogued as a Canadian issue.

The following is germane to the subject :

(e) *London, Middlesex.*

154. Obverse. Three swimmers. Legend : Excelsior. Beneath, at right, W. J. Taylor. Reverse. Wreath of aquatic plants. Within, engraved, Alliance Swimming Club, 600 yard race for the Captaincy, won by C. J. Miller, Aug. 12th, 1867. Below, W. J. Taylor, London. On edge, the names of the other contestants, in the order of their coming in. Silver. 30.

*American Journal of Numismatics*, October, 1879, p. 41.

Prize medal for a swimming match in the Serpentine. It would be well for Hygiene were such contests more frequent, and rewarded by appropriate medals.

C. THE NETHERLANDS.

155. Obverse. Two men plunging into the sea. Non. Natandum. Aut. Enatandum. Reverse. Arms of the family of Raverschott.

Van Peteghem Catalogue, Paris, 1874, No. 144.

This allegorical piece is a Treasury jeton of Brussels, in 1626. M. de Witte of that city has sent me the notes of a learned discussion of the attribution of this jeton, for which, unfortunately, I have not here the space.

D. FRANCE.

(a) *Boulogne-sur-Mer.*

156. Obverse. Bains Chauds Et Froids. In field, Hotel | Du Nord | etc. Reverse. Muhlberque A Boulogne Sur Mer. In field, a three-storied building.

Neumann, No. 39,744.

(b) *Paris.*

157. Obverse. The Serpent of Hygeia drinking from the patera. Reverse. Société De Hydrologie Médicale De Paris. Fondée 1855. Bronze. 23.

Frossard sixty-fifth sale, February 19th, 1887, No. 201.

E. ITALY.

158. In the Vatican series of medals of the Sovereign Pontiffs, there are several very beautiful allegorical medals of Our Saviour bathing St. Peter's feet, with the legends, variously abbreviated, Tv. Dominvs . Et . Magister. | Exemplvm. Dedi. Vobis. Of these I have in my collection one of Pope Innocent X., two different ones of Clement IX., and one, respectively, of Clement X., Innocent XI., Clement XI., Benedict XIII., and Gregory XVI.

Here also might be given baptismal medals, those allegorical representations of spiritual hygiene, an instance of the long series of which is the beautiful silver Scudo of Cosmo III., Duke of Tuscany, bearing the baptism of Jesus by St. John. This is in my collection.

F. BOHEMIA.

*City of Pilsen.*

159. Obverse. Two keys upon a shield. Städtische Schwimmschule | (rosette) In Pilsen (rosette). Reverse. Mestská Plovárna | V Plzni. Edges beaded.

Neumann, No. 39,660.

G. HUNGARY.

160. Obverse. A military trophy. In exergue: 1743. Reverse. The Empress Maria Theresa, crowned, descending

a staircase and saying, "Das Ist Das Veritable Ungarisch Wasser," empties a vessel of chamber lye in the faces of her kneeling courtiers. Bronze. Silvered. 24.

Montenuovo Cat., 1882, Parts 7-8, No. 1712.

This is in my collection. It is an amusing illustration of a douche bath by saline water, from an organic source, however, and may possibly be included here, though it is more legitimately to be classed among historical, or, rather, political and satirical medals.

Under the next Section, IV., Mineral Springs, there will be found several medals and tokens which might also properly be grouped with those now enumerated. I have preferred, however, to present here the pieces relating only to fresh-water and sea-water bathing, and reserve those of waters more ordinarily classed as medicinal for description by themselves.

(*To be continued.*)

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## EDITOR'S TABLE.

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PASTEUR'S SUCCESS.—The recent Report of the British Commission, fully confirming the claims of M. Pasteur, is the most important event of the year in the interest of preventive medicine. The Report states that Professor Burdon Sanderson, Dr. Lauder Brunton, and Mr. Victor Horsley went to Paris in May, 1886, and personally investigated the history of 90 patients residing in Paris, Lyons, and St. Etienne, whose names appear consecutively on M. Pasteur's list. Full particulars of all these patients are given in an appendix. In 31 instances there was no reliable evidence that the dog was rabid, in others the bites were inflicted through the clothes; but in 24 the patients had been bitten on naked parts by undoubtedly rabid dogs, and the wounds were not cauterized or treated in any way likely to have prevented the action of the virus. None of these 90 persons have died of hydrophobia. The Committee estimates that 8 would have died if the inoculations had not been practised. This, says the *British Medical Journal*, is the most precise evidence obtained by the Committee, but it would be difficult to over-estimate its value, and



it is well worthy the great time and pains expended in obtaining it. No previous observers or critics have contributed any evidence of the kind, and it must be held fully to confirm the claims advanced by M. Pasteur. The other statistics given are of a kind with which we are already familiar; taking the whole series of cases inoculated from October, 1885, to December, 1886, and using the lowest mortality ever estimated for untreated cases (5 per cent), the Committee is of opinion that, "making fair allowance for uncertainties, and for questions that cannot now be settled, we believe it sure that, excluding the deaths after bites by rabid wolves, the proportion of deaths in the 2634 persons bitten by other animals was between 1 and 1.2 per cent, a proportion far lower than the lowest ever estimated among those not submitted to M. Pasteur's treatment, and showing, even on this lowest estimate, the saving of not less than 100 lives."

The practical conclusion at which the Committee has arrived is, that until police regulations of the most stringent kind can be enforced with complete success, there will always be a considerable number of persons who will require treatment by the method of M. Pasteur. During the ten years ending 1885, the annual average of deaths from hydrophobia was 43, and this probably represents a total number of over 800 persons bitten by rabid dogs; it is not possible to say which, among this whole number, are not in danger of hydrophobia. Police regulations applied over the whole of Great Britain would very materially diminish this number, but the Committee is of opinion that, to be effective, the regulations must require (1) the destruction of all wandering, ownerless dogs; (2) discouragement of the keeping of useless dogs by taxation or other means; (3) prohibiting importation of dogs from countries where rabies is prevalent, or the imposition of quarantine; (4) compulsory use of muzzles in districts where rabies is prevalent.

#### MORTALITY AND MORBILITY STATISTICS AT THE MOST RECENT DATES.

ALABAMA.—*Mobile* Health Department reports for the month of June 84 deaths in a population estimated at 31,295, of which 26 were under five years of age, and representing an

annual death-rate of 32.19 per 1000. From zymotic diseases there were 30 deaths, and from consumption, 11.

CALIFORNIA.—The mortality for the month of June, reported by the Secretary of the State Board of Health from 75 localities, containing an estimated population of 607,100, was 801. Consumption, 121; pneumonia, 38; bronchitis, 13; diphtheria and croup, 28; typhoid-fever, 21; cerebro-spinal meningitis, 3. Small-pox continues in San Francisco.

*San Francisco*, in a population of 300,000, reports the number of deaths for June, 409; from diphtheria and croup, 15; typhoid-fever, 8; consumption, 70; pneumonia, 25; small-pox, 2. Death-rate, 16.05.

Small-pox is also reported at Irvington.

CONNECTICUT.—For the month of June, 1887, the mortality and chief causes of death in ten cities were as follows:

*Bridgeport*, 50; zymotic diseases, 13; phthisis, 3; pneumonia, 3; heart disease, 4. Deaths under five, 14. Death-rate, 15.

*Hartford*, 81; zymotic diseases, 23; phthisis, 5; pneumonia, 4; heart disease, 8; nervous diseases, 4. Deaths under five, 37. Death-rate, 16.3.

*Meriden*, 24; zymotic diseases, 3; phthisis, 5; nervous diseases, 3; pneumonia, 1. Deaths under five, 12. Death-rate, 13.1.

*Middletown*, 22; zymotic diseases, 1; phthisis, 2; pneumonia, 1; nervous diseases, 5; heart disease, 3. Deaths under five, 3. Death-rate, 15.

*New Britain*, 16; zymotic diseases, 1; phthisis, 1; pneumonia, 3. Deaths under five, 5. Death-rate, 10.6.

*New Haven*, 112; zymotic diseases, 22; phthisis, 15; pneumonia, 4; nervous diseases, 15; heart disease, 7. Deaths under five, 41. Death-rate, 16.8.

*New London*, 16; zymotic diseases, 4. Deaths under five, 6. Death-rate, 14.8.

*Norwalk*, 16; zymotic diseases, 2; phthisis, 1; pneumonia, 3. Deaths under five, 7. Death-rate, 12.

*Norwich*, 27; zymotic diseases, 4; phthisis, 5; pneumonia, 2. Deaths under five, 11. Death-rate, 12.9.

*Waterbury*, 49; zymotic diseases, 21; consumption, 5;

pneumonia, 6 ; nervous diseases, 4 ; heart disease, 1. Deaths under five, 27. Death-rate, 19.6.

In public institutions there were 14 deaths in New Haven, 13 in Hartford, and 7 in Middletown. These are deducted from the total mortality of their respective towns in estimating the death-rates. Total reports from 123 towns, comprising a population of 659,218, deaths, 817. Average annual death-rate, 14.8.

DELAWARE.—*Wilmington* reports 79 deaths during the month of June in an estimated population of 57,000, of which 30 were under five years of age. Death-rate per 1000, 16.98. From zymotic diseases there were 11 deaths, and from consumption, 9.

ILLINOIS.—*Chicago* reports for the month of June 1239 deaths in a population estimated at 720,000, of which 696 were under five years of age, and representing an annual death-rate of 20.66 per 1000. From zymotic diseases there were 394 deaths, and from consumption, 97.

*Rock Island* reports for four weeks ending June 25th, 16 deaths in a population estimated at 13,655, of which 7 were under five years of age. Death-rate per 1000, 14.06. From zymotic diseases there were 3 deaths, and from consumption, 1.

IOWA State Board of Health *Bulletin* of July 15th reviews the progress of sanitation generally, gives excerpts from the laws and proceedings of other States and other publications, decisions on various practical questions with regard to nuisances, the obligation of physicians to report cases of infectious diseases, compulsory vaccination, etc., and an abstract of mortality statistics of a few chief cities, home and foreign, at the most recent dates, including two only of Iowa : *Davenport*, population, 23,830, for the month of June, "deaths, 21, under five years, annual (?) death-rate, 0.94." Annual ratio per 1000, 7.8. *Keokuk*, population, 14,000, for the month of June, "deaths 13, annual (?) death-rate, 0.78." Annual ratio per 1000, 11.

LOUISIANA.—*New Orleans* reports for June 347 deaths in 176,500 white population, and 185 deaths in 66,250 colored

population, making the respective death-rates 23.59 and 33.50 per 1000, and 26.29 for the whole population of 242,750. The deaths from zymotic disease numbered 100, and from consumption, 69. There were 224 deaths under five years of age.

MARYLAND.—*Baltimore* reports for four weeks ending June 25th 585 deaths in a population estimated at 417,220, of which 266 were under five years of age. Death-rate per 1000, 18.10. From zymotic diseases there were 133 deaths, and from consumption, 74.

MICHIGAN.—For the month of June, 1887, compared with the preceding month, the reports indicate that diarrhœa, cholera-morbus, intermittent-fever, and cholera-infantum increased, and that pneumonia, influenza, bronchitis, tonsilitis, and measles decreased in prevalence. Compared with the average for the month of June in the nine years 1879–1887, neuralgia increased, and intermittent-fever, remittent-fever, consumption of lungs, scarlet-fever, diphtheria, and bronchitis were less prevalent in June, 1887. Reports from all sources show diphtheria reported at 9 places more, scarlet-fever at 10 places more, typhoid-fever at 8 places more, measles at 14 places less, and small-pox and typhus-fever each at 1 place more in the month of June, 1887, than in the preceding month. Including reports by regular observers and others, diphtheria was reported present in the month of June, 1887, at 39 places, scarlet-fever at 42 places, typhoid-fever at 12 places, measles at 36 places, small-pox and typhus-fever each at 1 place.

Of the meteorological conditions compared with the preceding month, the temperature in the month of June, 1887, was higher, the absolute humidity was more, the relative humidity was slightly more, the day and the night ozone were less. Compared with the average of corresponding months in the nine years 1879–1887, the temperature was slightly higher, the absolute and the relative humidity were slightly more, and the day and the night ozone were slightly less.

At the regular quarterly meeting of the Board, at Lansing, July 12th, plans were approved for the sewerage of the Asylum for the Insane, at Pontiac; and, so far as submitted by the



architects, the plans for ventilating and warming the Northern Prison at Marquette were also approved. Dr. Vaughan reported that he had found tyrotoxicon in the ice-cream, which poisoned one hundred and fifty people at Amboy, O., July 4th, and which had been sent to him by the Secretary of this Board. The Secretary presented a tabulated statement, showing that in dealing with scarlet-fever in 1886, when health officers acted promptly and efficiently, and the people co-operated perfectly, there were only one fourth as many cases, and about one fifth as many deaths on the average as in outbreaks where they did not so act. During the quarter there had been one case of small-pox, in Detroit; a case of typhus-fever had also been reported recently at the same place.

*Detroit* reports for the month of June 334 deaths in a population estimated at 185,000, of which 97 were under five years of age, representing an annual death-rate of 21.96 per 1000. From zymotic diseases there were 96 deaths, and from consumption, 39.

MINNESOTA State Board *Bulletin* for June not received.

*St. Paul* reports 198 deaths during the month of June in a population estimated at 150,000, of which 146 were under five years of age. Death-rate per 1000, 15.84. From zymotic diseases there were 99 deaths, and from consumption, 10.

*Minneapolis*—no report.

MISSOURI.—*St. Louis* reports 949 deaths during the month of June in a population of 420,000, of which 561 were under five years of age. Death-rate per 1000, 27. From zymotic diseases there were 327 deaths, and from consumption, 63.

NEW YORK.—*The State Board of Health Bulletin* reports the total mortality of 120 cities and towns, comprising about 3,500,000 inhabitants, for the month of June, 7414, of which 40 per cent were of persons under the age of five years. From zymotic diseases there were 240 per 1000 total mortality; 111 per 1000 were from diarrhœal diseases; 7.25 per 1000 from typhoid-fever; from croup and diphtheria, 64 per 1000. *Small-pox* in New York and Brooklyn only, *infra*. From consumption the ratio of mortality is 127.87, and 214.53 per 1000 above the age of five years. The combined death-ratio per 1000 from zymotic diseases, consumption, and puerperal

diseases is 375.80. From acute respiratory diseases there were 79.33 deaths per 1000 total mortality.

*New York City*, 1,481,920 : Deaths for the month, 3224 ; under five years, 1538 ; of zymotic diseases per 1000, from all causes, 294.05. By croup and diphtheria, 275 ; typhoid-fever, 16 ; measles, 23 ; malarial diseases, 31 ; whooping-cough, 11 ; small-pox, 5 ; consumption, 411 ; acute respiratory diseases, 273. Death-rate, 26.

*Brooklyn*, 757,755 : Deaths, 1306 ; under five years, 663 ; of zymotic diseases per 1000, from all causes, 282.30. By croup and diphtheria, 98 ; typhoid-fever, 1 ; malarial diseases, 18 ; whooping-cough, 4 ; scarlet-fever, 24 ; measles, 8 ; small-pox, 9 cases, 3 deaths ; consumption, 148 ; acute respiratory diseases, 119. Death-rate, 21.

*Buffalo*, 202,818 : Deaths for four weeks, ending June 25th, 292 ; under five years of age, 109 ; from zymotic diseases per 1000, from all causes, 202.05 ; croup and diphtheria, 8 ; consumption, 31 ; acute respiratory diseases, 33. Death-rate, 18.7.

*Rochester*, 110,000, month of June : Deaths, 139 ; under five years, 60 ; of zymotic diseases per 1000, from all causes, 207.15. By croup and diphtheria, 8 ; consumption, 18 ; acute respiratory diseases, 10. Death-rate, 15.17.

Cities of 20,000 inhabitants and upward with the *lowest* death-rates in the State of New York for the month of June were Yonkers, 26,000 : death-rate, 9.23 per 1000 ; Binghamton, 25,000 : 11.04 ; Syracuse, 78,000 : 13.08. The *highest*, Long Island City, 21,000 : 29.18 ; Troy, 65,000 : 26.40 ; New York : 26.

NORTH CAROLINA.—Monthly *Bulletin* for June reports from 48 counties ; measles prevailed more or less in 13, but generally of mild type. Whooping-cough also in 13 counties ; diphtheria in 2 ; typhoid-fever in 14 ; malarial fevers in 9. Diarrhœal diseases are reported in 32 counties, and a number of cases of fatal dysentery and “ bloody flux.” Hog-cholera and chicken-cholera continue in two or three counties. County public buildings, in general, in good condition.

Vital statistics for the chief cities during the month as follows :

*Wilmington* : population—whites, 9900 ; colored, 13,500—23,400. Death-rates : white, 14.5 ; colored, 18.7 : 17.

*Charlotte*: population—white, 6000; colored, 5000—11,000. Death-rates: white, 38.0; colored, 45.6: 41.5.

*Asheville*: population—white, 4641; colored, 2607—7248. Death-rates: white, 51.7; colored, 50.6: 51.3.

*Durham*: population—white, 3000; colored, 2500—5500. Death-rates: white, 16.0; colored, 14.4: 15.3. Doubtful returns.

*Fayetteville*: population—white, 2500; colored, 1800—4300. Death-rates: white, 14.4; colored, 30.0: 19.5.

*Raleigh* and *New Berne*: no reports.

*Illuminating oils* is the subject of a supplementary report by Professor W. G. Simmons, by which it appears North Carolina maintains the unenviable distinction of no laws or other safeguards against the use of the most dangerous oils, without any tests of the degree of temperature at which they will explode. The people who use them are consequently subject to frequent "accidents" without any recourse. "With a view of ascertaining the general quality of the illuminating oils sold and consumed in our State, he obtained from the various retail dealers within his reach twenty-nine samples of oils, and tested the same, and with the following results from the flash test, using a standardized Fahrenheit's thermometer: One sample flashed at 84°, two at 92°, one at 94°, one at 95°, four at 99°, one at 111°, two at 112°, two at 113°, three at 114°, two at 115°, two at 117°, two at 118°, and six, respectively, at 119°, 122°, 124°, 129°, 131°, and 144°. By inspection of these numbers, it will be seen that more than twenty-five per cent of these oils flashed below 100° F. The corollary from these facts is that legislation is needed in our State to protect the lives, health, and property of our people against the sale and use of dangerous illuminating oils."

OHIO.—Weekly health *Bulletin* for five weeks ending July 15th reports cases of measles, 108; diphtheria, 61; scarlet-fever, 33; whooping-cough, 75; typhoid-fever, 29; typho-malarial fever, 35; cholera-infantum, 85; other diarrhœal diseases, 562.

Compared with the preceding five weeks, measles decreased 587 cases, diphtheria, 61, scarlet-fever, 34, and whooping-cough, 103 cases; typhoid-fever increased 9 cases, and typho-malarial-fever, 8 cases.

*Cincinnati* reports for the month of June 498 deaths in a population estimated at 325,000, of which 235 were under five years of age, representing an annual death-rate of 18.38 per 1000. From zymotic diseases there were 127 deaths, and from consumption, 57.

Annual report of the Health Department for 1886: Marriages, 2008, 1340 less than the licenses issued by the Probate Court, and 279 less than for the previous year, showing the disregard of the statutory regulation and incomplete returns. Of births, the returns are still more deficient—"midwives, as a rule, being more prompt in making reports of births than physicians." Reports of contagious diseases are still neglected to a considerable extent, though there is in this regard some improvement by physicians, since some have been made examples of by prosecution. The faults appear not to be for the want of urging by the health officer, but of sufficient appreciation of the importance of such reports to the welfare of the State and people, in a great measure due, until recently, to an incompetent health service. The total number of deaths reported during the year, believed by the health officer to be at least approximately complete, was 6170: 18.98 per 1000. Of infectious diseases, the most prevalent was diphtheria, from which there were 195 deaths; croup, 170; typhoid-fever, 151; measles, 145; scarlet-fever, 104; whooping-cough, 41, and from other zymotic diseases, 536: 1342—21.7 per cent of the total from all causes. From consumption, 850—13.8 per cent. Of the total number, 2645, or 42.9 per cent, were of children under five years of age.

*Cleveland* reports 267 deaths during the month of June in a population of 210,000, of which 132 were of children under five years of age. Sixty-five were caused by zymotic diseases; measles, 22; diphtheria and croup, 14; and from consumption, 33. Death-rate per 1000 of population, 15.25.

*Toledo* reports 85 deaths during the month of June in a population of 73,000, of which 35 were under five years of age. From zymotic diseases there were 16 deaths, and from consumption, 11. Death-rate per 1000, 13.97.

PENNSYLVANIA.—The seventh regular meeting of the State Board of Health was held at Harrisburg July 13th. The Secretary submitted a detailed report of the progress of sani-



tary work in the State since the previous meeting, laying special stress on the inadequacy of the Quarantine of the Delaware River and Bay, even to the necessities of a city of 80,000 inhabitants, seventy years ago, and scarcely improved upon since, as a subject of constantly increasing importance and anxiety. A case of small-pox had been reported by Health Officer Gray, of Pittsburg, traced to the steamer "Lord Gough," at the port of Philadelphia.

Resolutions were adopted as follows: "In view of the fact that small-pox is occasionally introduced into Pennsylvania and the neighboring States through the foreign and coastwise commerce of the port of Philadelphia, the State Board of Health earnestly requests the health authorities of said port to consider favorably the expediency of adopting still more rigid quarantine regulations against the above-mentioned disease, and of enforcing them throughout the entire year.

"In the opinion of the Board, the quarantine facilities now existing on the Delaware Bay and River are insufficient and antiquated in character; and this Board therefore petitions the Government of the United States to complete the partial and inadequate arrangements which now exist at the mouth of the Delaware Bay, and to extend the term of quarantine against small-pox throughout the entire year."

Numerous reports had been received on the continuous dangers of soil soakage and water pollution from cesspools and privy vaults in various places, the use of water streams as open sewers, badly situated and undrained slaughter houses and other nuisances, and the difficulties in the way of their abatement. Reports of the standing committees were briefly—"progress," amounting to nothing. Dr. David Engleman was elected president for the ensuing year in the place of Dr. Germer, who was unable to be present on account of illness.

*Philadelphia* reports for four weeks ending June 25th, 1531 deaths in a population estimated at 993,801, of which 621 were under five years of age. From zymotic diseases there were 213 deaths, and from consumption, 201. Death-rate per 1000, 20.3.

*Pittsburg* reports for four weeks ending June 25th, 373 deaths in a population estimated at 200,000, of which 214 were under five years of age. From zymotic diseases there were 36 deaths, and from consumption, 35. Death-rate per 1000, 23.25.

TENNESSEE *Bulletin* reports : The principal diseases named in the order of their greater prevalence in the State for the month of June were *dysentery*, *malarial-fever*, *diarrhœa*, *typhoid-fever*, *cholera-morbus*, and *cholera-infantum*. Measles are reported in 13 counties ; whooping-cough in 9 ; scarlet-fever in 6 ; diphtheria in Shelby (Memphis), and erysipelas in Montgomery.

In the chief cities the respective death-rates for the month, per 1000 of population, annually, are reported as follows :

Chattanooga, white,	22.20 ;	colored,	50.40 : 31.20
Clarksville,	" 19.20 ;	"	16.00 : 18.00
Columbia,	" 20.01 ;	"	12.90 : 16.93
Knoxville,	" 29.26 ;	"	40.96 : 31.88
Memphis,	" 19.69 ;	"	40.13 : 26.94
Nashville,	" 19.04 ;	"	30.00 : 23.00

The mean temperature was  $73^{\circ}.4$ , the highest for the past five years, except in 1885, when it was  $74^{\circ}.6$ . The highest temperature reported was  $100^{\circ}$ , on the 19th and 20th, and was  $2^{\circ}$  above the record of the five preceding years. The lowest was  $45^{\circ}$ , recorded on the 25th, although from most of the stations in the State the minimum was recorded on the 1st and 2d. This was the lowest reported during the past five years. It was reported from the Cumberland plateau, one of the most elevated stations in the State. The range of temperature was several degrees more than that previously reported.

The mean rainfall was 2.77 inches—by far the smallest amount for June in many years.

VERMONT.—*Burlington* reports for the month of June 21 deaths in a population estimated at 13,500, of which 9 were under five years of age, representing an annual death-rate of 18.06 per 1000. From zymotic diseases there were no deaths ; from consumption, 4.

VIRGINIA.—*Richmond* reports for the month of June 209 deaths in a population estimated at 100,000, of which 101 were under five years of age. From zymotic diseases there were 55 deaths, and from consumption, 23. Death-rate per 1000, 25.08.

WEST VIRGINIA.—The act of March 8th, 1881, establishing the State Board of Health, specially stipulates that every

member of the Board "shall have practised medicine twelve years continuously," yet Governor Wilson has recently appointed a member who is not only incompetent under the law with regard to time, but who has attended but one course of medical lectures, and is deficient in the requirements of the Medical Practice Act, and is consequently—not being registered—incompetent to practise medicine in the State! That the choice of such an incompetent by the Governor in the face of over thirteen hundred registered physicians, many of whom have practised medicine continuously for more than twelve years, should be regarded as an insult to the profession is surely not surprising. To subordinate the State Board of Health to mere political favoritism is to deprive it of its usefulness, and ultimately to destroy it. And it is sincerely to be hoped that the spirit of the physicians of the State, aroused by this political act, will be successful in recalling the Governor to a proper exercise of his functions in this regard for the good of the State, and that he may be induced to rectify the mistake he has made.

WISCONSIN.—*Milwaukee* reports for the month of June 213 deaths in a population estimated at 180,000, of which 67 were under five years of age. From zymotic diseases there were 40 deaths, and from consumption, 26. Death-rate per 1000, 14.2.

CHANGES IN THE PROVINCIAL BOARD OF HEALTH.—Dr. Oldright and Professor Galbraith, of Toronto, have recently been replaced by Dr. Macdonald, of Hamilton, and Dr. McKay, of Woodstock. The *Canadian Practitioner* thinks these changes unfortunate, and that it is not in the interest of the country to lose the services of such an able and indefatigable enthusiast in sanitary sciences as Dr. Oldright. It is generally acknowledged that the Board has done excellent work, and the public in the Province have received great benefit from their labors. Much credit is due the founders of this organization, and if there is one above all others who deserves special mention it is Dr. Oldright, who gave so much of his time in making the organization a perfect success.

It is to be hoped that the new members, who have the advantage of taking office in a Board so well organized and equipped, will maintain the high standard of excellent work to which it has attained by continuous progress in life-saving.

THE medical health officer of Montreal is reported to have recently made an investigation regarding the care of the city's foundlings, and states, according to the *True Witness*, that out of over 700 in the care of the Grey Nuns, 678 died during one year.

YELLOW-FEVER at *Key West*, as summed up by the most recent reports of Surgeon-General Hamilton, August 11th, total number of cases, 233; deaths, 46; increase since July 14th, 123 cases and 16 deaths. At *Egmont Key*, the refuge station, one death occurred from yellow-fever, July 15th.

*Havana*: of 515 deaths registered during the months of June and July, 233 were caused by yellow-fever, 39 by enteric-fever, 36 by "pernicious-fever," 11 by diphtheria and croup, 5 by measles, and 155 by small-pox. Merida, Yucatan, May 14th, 4 cases of yellow-fever.

SMALL-POX.—Deaths from small pox, reported in foreign cities at the most recent dates, received as follows: During the week ending July 23d—Sheffield, 1; Nice, 5; Paris, 8; Bucharest, 1; Trieste, 5; Lisbon, 3. Week ending July 16th—Vienna, 1; Chemnitz, 1; Pesth, 1; Prague, 3; Cracow, 1; St. Petersburg, 7; Warsaw, 8. Week ending July 9th—Debreczin, 1; Munich, 23; Cairo, 2; Alexandria, 1. June 5th to 11th—Rome, 7. During month of June—Genoa, 4; Saragossa, 15; Marseilles, 4; Nantes, 2; Kingston, Jamaica, 2. During month of May—Bologna, 13; Milan, 38. During months of June and July—Havana, 155.

Santiago: "Small-pox is epidemic here." During the month of April—Buenos Ayres, deaths from small-pox, 43; Montevideo, death from small-pox, 13.

CHOLERA.—Buenos Ayres, deaths reported from cholera during the three months ending June 30th, 598. Calcutta, during the week ending June 18th, 8; Palermo, 5. Consular reports from Surgeon-General Hamilton's Abstract: Malta, August 3d: "Cholera declared here." Messina, August 6th: "Yesterday 3 deaths from cholera, originating here." Naples, August 4th: "Several cases of cholera here." Palermo, July 25th: On 23d and 24th inst. 5 cases and 4 deaths occurred among the Palermitans (not fugitives).



## LITERARY NOTICES.

MENS SANA IN CORPORE SANO.—An experimental class in physical culture has been conducted with gratifying results at the State Reformatory, Elmira, N. Y., under the supervision of Dr. H. D. Wey. The object in view was to determine the value of physical culture as a factor in intellectual and moral training. The men selected were eleven in number, the dullards of the institution, incapable of prolonged mental effort, lacking in self-confidence, perseverance, and the power to grasp even the simplest facts. The course consisted of Turkish baths, massage, a severe course of calisthenics, with special and restricted dietary. Within six months the stride made in moral and intellectual development is said to have been "enormous." The marking of the class rose from an average of forty-six per cent to seventy. No lapsing into their former inertia has been noticed since the athletic exercises were discontinued.

In a letter to *Science* June 17th, 1887, Dr. Wey says: "I do not think the improved mental condition of these men can be attributed to other than the strengthening of the brain-centres by the cultivation and development of muscle and muscles under the control of these same nervous centres, the one participating and taking part in the improvement of the other. From the words of commendation I have received, and noting the progress of the men under conditions that once seemed to promise so little to them by reason of their stupidity and obtuseness, I regard my class in physical culture as more than an experiment—a success—as showing that something more than mere brawn can be accomplished by muscular exercise when properly selected, guided, and governed."

Query: Is the experiment not worth trying in hospitals for the insane?—*Journal of Insanity*.

ON THE PATHOLOGY AND TREATMENT OF GONORRHOEA AND SPERMATORRHOEA. By J. L. MILTON, Senior Surgeon to St. John's Hospital for Diseases of the Skin, London.

Octavo, pp. 484. Illustrated. Price, bound in extra muslin, \$4. New York : William Wood & Company. While this is an abridgment of earlier editions of the same work, it is substantially complete, and moreover fully up to date with reference to recent advances in the pathology and treatment. The need of such a work is among the earliest realizations of every medical practitioner, for of all subjects in the college course, measured by the amount of attention subsequently required for their proper attention by medical practitioners generally, the subjects here treated of are among the most insufficiently considered ; insomuch, that there are but few practitioners who do not find among their first necessities much more knowledge necessary for the treatment of these diseases than they have acquired during their college course, or can find in their text-books. The subjects are very thoroughly discussed in their attitudes, based upon extensive practical observation and investigation. "Specifics" are given their true place, and treatment based upon ascertained pathological knowledge instead is the striking feature of the work throughout.

MEDICAL REGISTER OF NEW YORK, NEW JERSEY, AND CONNECTICUT, for the year commencing June 1st, 1887, published under the supervision of the New York Medico-Historical Society. WILLIAM T. WHITE, M.D., Editor, 130 East Thirtieth Street, New York. This (the twenty-fifth volume) veritable *multum in parvo* manual is fully up to its usual standard of excellence. It is larger by twenty pages than the preceding volume, but the editor states prefatorially that the increase in the New York City list of physicians is only *twelve*—that is, 1938 this year as against 1926, 1886–87. The number in other localities comprehended in the volume, and of pharmacists, dentists, and nurses, is not summarized. The twenty additional pages are accounted for by about that many more on the "Medical History of New York," contributed by Dr. John Shrady, and obituary notices of the physicians deceased during the year. As a book of reference for everything relating to physicians, pharmacists, and dentists, and the numerous libraries, societies, corporations, and institutions with which they are more or less connected in the States of New York, New Jersey, and Connecticut, it is indispensable. It

contains, besides, a complete catalogue of the Medical Colleges of the United States which, by virtue of their charters, are empowered to grant the degree of Doctor of Medicine, chronological records, and much other matter of interest to the profession which it represents.

CARE OF THE INSANE. *Fourth Report of the State Committee of Lunacy of the Commonwealth of Pennsylvania*, September 30th, 1886, gives :

The entire number of insane residents in institutions under the official supervision of the committee, on September 30th, 1886, was 5923, an increase of 283 over the number at same date in previous year. The number resident in State hospitals increased 314, in private hospitals 31, in private houses 8, in prisons 12 ; on the contrary, the decrease in almshouses was 82, although the removal of the insane has been much restricted by the overcrowded condition of the State hospitals. This, it is hoped, will be partially remedied during the coming year by the completion of the new buildings at Harrisburg, Norristown, and elsewhere.

But there is still pressing demand for more room, and the committee urges the formation of a new hospital district, to comprise the counties of Philadelphia, Delaware, and Chester, with a capacity for 1500 patients. The committee also recommends that better provision be made for the increasing number of insane criminals, now inadequately provided for in jails and penitentiaries.

Of the total number of 1626 patients admitted during the year, 413 were of foreign birth and 82 unknown. Of those of foreign birth, 178 were of Ireland, 125 Germany, and 55 England. The whole population under treatment was 6108. Discharged—recovered, 342 ; improved, 402 ; unimproved, 412 ; not insane, 2 ; died, 398. Per cent of population restored, 5.60 ; died, 6.52 ; of average number treated restored, 7.43 ; of average number treated died, 8.64.

*Sixty-third Annual Report of the Officers of the Retreat for the Insane at Hartford, Conn.*, April, 1887. March 31st, 1886, population, 134 ; admitted during the year, 80 ; discharged during the year, 81. Whole number under treatment, 214. Present number in the Retreat (March 31st), 133. In the enumeration of the causes of insanity in 80 cases admitted

during the year (1 was found not to be insane), 16 are attributed to idiopathic insanity, 13 to alcoholism, 9 to climacterie, 6 senile, 19 to various causes 1 to 4, and 19 unknown. Recovered during the year, 28—35 per cent of the admission; deaths, 19. The nativities are not given.

*Report of the Resident Physician of Brigham Hall*, a hospital for the insane, Canandaigua, N. Y., for the year 1886. Patients in the hospital at the beginning of the year, 64; admitted, 31; discharged, 29; died, 4; remaining, 62. "During the last ten years only once has the daily average reached a higher number—66—in which year there were under treatment 11 addicted to the excessive use of stimulants and narcotics, as compared with one during the last season. There were many applicants for the admission of inebriates, indicating that the provision for their proper care and treatment is still inadequate."

*Report of the Commissioners to Locate an Asylum for the Insane in Northern New York*, addressed to the Legislature of New York, by William P. Letchworth and P. M. Wine, Commissioners, is an admirable and, happily, an effectual appeal for additional provision for the care of the insane in the State of New York. An act of the Legislature was passed May 18th, "to establish and organize the St. Lawrence State Asylum for the Insane, and making an appropriation for purchase of site and erection and construction of buildings and sewers, and improvement of grounds," and a commission consisting of the State Comptroller, Hon. Alfred E. Chapin, the Commissioner of Lunacy, Dr. Stephen Smith, and the Superintendent of the Asylum for the Care of Insane Criminals, Dr. C. F. MacDonald, to carry it into effect—to purchase a farm of 280 acres and build the asylum adequate for the care of 500 patients, not to cost over \$300,000. It is needless to say that the commission is specially well chosen for the intended purpose.

THE SEGUINE PHYSIOLOGICAL SCHOOL FOR FEEBLE-MINDED CHILDREN, in its Ninth Annual Report, 1886-87, bears continuous testimony to the wisdom of the founder of his school, the late Dr. E. Seguire, who left it a legacy to his widow.



Just before his death, in October, 1880, he closed a school circular with the following paragraph :

" This application of physiology to education was the work of my youth, and has been the main object of my thoughts for forty-two years. I give it my last years, with the assistance of my wife, meaning to leave her the young and clear-headed exponent of the method I have scattered, but not exhausted, in many books, pamphlets, and living lessons."

The practical points that have been elucidated during the years that have intervened are :

- 1, The best age for the beginning of the needful training is from six to twelve years ;
- 2, *individual instruction* is necessary for the best results ;
- 3, association with others similarly afflicted, to a certain extent, is necessary in order to arouse emulation and fix attention ;
- 4, large institutions, though excellent in their way, cannot, in the nature of the case, accomplish as good results as individual instruction and a limited association with other pupils ;
- 5, private home training and the isolation of the pupil is still more prejudicial to the best interests of the child ;
- 6, nothing short of the highest qualifications of special study and almost infinite patience and perseverance on the part of the instructor will be followed by successful results, and,
- 7, justice to the child and the instructor alike require that a course of personal instruction of not less than three years' duration should be insisted upon at the outset.

With a competency which could be acquired in no other way than by the most devoted attention to a sacred trust, Mrs. Seguire has succeeded in the most difficult of all educational work—that of developing the minds of imbecile and idiotic children. Her work is, indeed, worthy of the highest commendation in all respects. Communications should be addressed Mrs. Elsie M. Seguire, 168 West Fifty-fourth Street, New York.

INSTABILITY OF THE ATMOSPHERE.—To the notable series of articles on the surface of the earth which Professor N. S. Shaler, of Harvard University, is contributing to *Scribner's Magazine*, he contributes to the August number a paper entitled " The Instability of the Atmosphere," which treats, in detail, the whole subject of the origin and development of storms, especially tornadoes and cyclones. The article is

fully illustrated from diagrams and photographs furnished by the author.

SCIENCE, which began its publication five years ago, has recently changed its shape to a more convenient page, and gives every proof of a deserved prosperity. The subjects discussed are commendable for their practical utility, and no intelligent reader will fail to find something in every number worthy of attention. Recent numbers contain articles on International Copyright with England, The Increase of State Interference in the United States, Preventive Medicine, What to Eat with Tea and Coffee, New Explorations in Africa, Pasteur's Methods, and Leprosy in Louisiana. \$3.50 per year; trial subscription, four months, \$1. N. D. C. Hodges, 47 Lafayette Place, New York.

BROMIDIA.—Dr. W. H. May, of New York, writes that he has had very successful results in the administration of *bromidia* in cases having their origin in disorders of the nervous system, such as cholera infantum, paralysis, insomnia, etc.; and that he finds it to be of special value in treatment of delirium tremens and the results of debauch, it being retained upon the stomach and producing the desired calmness and sleep, when morphia and other soporifics have failed to do so, and thus rendering the disorder amenable to further treatment. He has also prescribed it successfully in the terrible state of nervous exhaustion due to opium *habitués* endeavoring to relinquish the habit. And, finally, as the result of experience, he pronounces it the “hypnotic *par excellence*.”

THE WONDERFUL DRUG CLERK.—A gentleman received a note from his lawyer which he was unable to decipher. On his way to his office he met a friend, at the door of a drug-store. The friend, after vainly attempting to read the note, suggested that they step inside and hand it to the druggist without comment. The druggist, after studying it in silence for a few minutes, stepped behind the prescription case, and in a short time returned with a bottle of medicine, duly labelled and bearing directions. When the gentleman saw his lawyer, he was informed that the note was a notice for him to call at his office between three and four the following day. It is a pretty difficult matter to “stick” the regulation druggist.—*Medical Age*.

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## PREVENTIVE MEDICINE.

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ABSTRACT OF PAPERS PERTAINING TO THE PREVENTION OF DISEASE, READ BEFORE THE VARIOUS SECTIONS OF THE NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON, SEPTEMBER 5th-10th, 1887.

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SECTION XV.—PUBLIC AND INTERNATIONAL HYGIENE.  
*President*, Professor JOSEPH JONES, M.D., of New Orleans.  
*Secretaries*, Drs. Castellanos, Felix Formento, J. R. Le Momier, B. D. Taylor, and Walter Wyman.

*First Day*, September 5th, the section was called to order at three o'clock by the President, who, after calling for reports, proceeded to deliver his

### OPENING ADDRESS.

It is the province of hygiene, he said, to seek out and determine the causes of disease, and to formulate rules for their prevention. It is, therefore, called preventive medicine, although this name does not include all that must be included under this important branch of science, a knowledge of the causes and mode of propagation of diseases being necessary in order to formulate rules for their prevention. It is therefore evident that hygiene is largely dependent for its perfection on the advances made in chemistry, physiology, pathology, and etiology.

While it is true that a few of the subjects embraced under the head of practical hygiene have engaged the attention of some of the profoundest thinkers and most renowned leaders

of men from an early historical age, at the same time it must be admitted that up to near the close of the last century, hygiene existed upon an empirical basis by reason of the imperfection of the collateral sciences and the wants of those physical appliances and microscopical and chemical instruments, reagents and methods of analysis and investigation, made available in the nineteenth century, for inquiries of such a difficult and recondite a character as to give it a substantial footing.

It is well established that owing to the advance in knowledge and the improvements in the sanitary construction of dwellings, towns, and cities, and more abundant supplies of cheap clothing, good water, and wholesome food, the application of such preventive measures as vaccination and a more enlightened system of medical practice, life has been greatly protected and prolonged. Two centuries ago the death-rate of London was 80 per 1000 of the population. It is now less than 23. A century ago the natives of the world could hardly keep the sea on account of scurvy, but by the discovery of the antiscorbutic properties of lime juice by Captain Cook, and the use of fresh canned food and the improvements in naval architecture and hygiene since his day, not only scurvy, but ship-fever and, to a great extent, yellow-fever are diseases of the past.

Jails and hospitals are no longer foul and loathsome hot-beds of infectious diseases; the galling shackles have been stricken alike from the feeble limbs of the insane, the slave, and the serf. . . .

He discussed the general subject in a threefold aspect: Domestic, National, and International Hygiene.

First, Domestic Hygiene.—The family is the unit of the village, town, city, state, and nation. From the union of man and wife spring the perpetual foundation of life and strength, by which the ravages of pestilence may be prevented.

Households founded and conducted in violation of the laws of hygiene are standing menaces to the public health, and the danger is increased a thousandfold by congregating them into towns, villages, and cities. Hence sanitary education and sanitary reform must begin in the household. Meteorological conditions could in a large measure be made amenable to the



exercise of sanitary measures. Cold and heat, moisture and dryness, not properly regarded by the adaptation of clothing, shelter, and drainage, mean malaria, enteric-fever, yellow-fever, and other fatal diseases. Asiatic cholera, although demonstrated to be indigenous in hot and moist climates and countries, appears capable of being propagated chiefly through the medium of trade and commerce, but its ravages are nevertheless measurably dependent upon local conditions.

Drainage and sewerage are important sanitary measures in all climates. That stagnant ground-water, excrement, and garbage must be speedily removed is a fact well recognized by all enlightened communities.

Second, Public and National Hygiene. In this division of the subject is comprehended the organization of boards of health and sanitary administration. In the United States the subject is comparatively new, excepting quarantine, which had its beginning at an early period in our history. But municipal health organizations had made considerable advance in recent years, and State boards of health have now become so general as to make their influence felt throughout the country.

Among the most important questions now before us is vital statistics in its application to race distinctions, with particular reference to the African race, so greatly lacking in necessary hygienic knowledge for its protection. Vital statistics also held an exceedingly important relation to the third division of our subject—International Hygiene—as a standard of the progress of measures for prolonging human life among different nations, communities, military and naval services.

*Second Day, September 6th.*—The first paper was a

“REPORT OF AN INQUIRY INTO THE FACTS RELATING TO THE EFFECTS OF OVERFLOW OF THE MISSISSIPPI RIVER,”  
by RICHARD DAY, M.D., of Baton Rouge, La.

The paper consisted of deductions and conclusions obtained by addressing letters of inquiry to five hundred physicians residing in Southern localities, and showed that overflows, as a general rule, are injurious to the public health ; that they are more or less injurious according as the inundations are late or early

in the season, and whether of long or short duration. That their evil effects upon health are lessened or entirely antagonized by good, natural, or artificial drainage, and by copious showers of rain occurring during the period of subsidence of the waters.

That rice culture is inimical to health only by reason of the improper and unsanitary manner of its cultivation. In the culture of rice the common plan of keeping the fields covered for long intervals with stagnant water should be avoided, and in lieu thereof frequent irrigation with fresher and purer water should be adopted; the growing crop being supplied thus as often as needed, and ditches so constructed as to let off the superincumbent water rapidly. With regard to race distinctions, while it appears to be true that the colored race is less susceptible to the injurious effects of overflows, marshy, and malarial soils than the white race, where they are affected, malarial diseases are more fatal in them than in the white race.

The use of rain-water stored in large cisterns, both for drinking and cooking purposes, was especially advocated in such regions, as the soil water was generally impure.

To promote the health of laborers and residents in the river deltas and lowlands, the dwellings should be not less than four feet from the ground, the floors laid tight, and the doors and windows so arranged as to afford free ventilation, with galleries on all sides wide enough to prevent beating rains from wetting the rooms; the houses should be erected on elevated ridges, so as to prevent water settling under or around them; only a few shade trees should be allowed to grow to break the force of the direct rays of the sun, and all brush and undergrowth should be removed, so as to facilitate the free movement of atmospheric currents.

In conclusion, he advised the importance of rigid cleanliness of person and surroundings, and strict observance of general sanitary rules.

The paper also showed that under improved methods of rice culture and management of lands subject to overflows the frequency and virulence of disease incident to these localities have been notably diminished.

The discussion of the paper which followed showed that

some confusion had been created by the want of co-ordination. Some correspondents always found malarial disease to increase immediately after overflow of the rice fields, while others noticed no increase of malarial diseases until the flow had receded. The next paper was

“THE HISTORY OF HYGIENE IN MODERN EGYPT, WITH SOME CRITICAL REMARKS AND PRACTICAL SUGGESTIONS,” by Dr. J. A. S. GRANT (Bey), of Cairo, Egypt.

Firstly, the period immediately before the time of Mohammed Ali Pasha—a period of utter chaos in the medical art.

Secondly, the enlightened rule of Mohammed Ali established in due time a Sanitary Department for the military, and ultimately for civilians.

Doctors were brought from Europe in 1825 for this purpose, and Egyptians were sent to Europe to study medicine, and thus be fit for teaching it on their return to Egypt.

Egypt had till now been considered unclean by Europe and Turkey, and was kept in permanent quarantine, which completely destroyed Egypt's commerce.

After the sanitary system had been established for several years, Europe was invited to send medical missions to report on the sanitary state of the country.

France, Austria, Turkey, and Russia accepted the invitation, and sent missions that reported favorably to their respective governments, so that the quarantine was taken off and Egypt was free to develop the commerce she had lost.

These missions declared that plague had disappeared from the country, and that there had not been a case of cholera for several months.

Time proved the correctness of the view taken by Europe in this matter, for plague has not been seen in Egypt since 1844, and cholera only at lengthened intervals, being always an imported malady.

*Sed tempora mutantur et nos in illis mutamur*, for Britain now wishes to have cholera declared an endemic disease of Egypt, losing sight, perhaps, of the natural result if such a declaration were accepted by Europe, that Egypt would again be put upon a perpetual quarantine.

To establish this baseless declaration, three medical missions

were rather hurriedly gotten up to support the action of the British Government in this matter.

I may safely say at this date that they were one and all of them complete failures, although that did not in the least divert the political current that still rushes on in the same channel, if one may judge from the continued overt and covert acts of government officials against those who have refused to be actuated by politics *versus* science.

Europe sent her own medical missions to study the question of the endemicity of cholera in Egypt, and as they all came to the conclusion that it was an imported disease from India, quarantine was not imposed by Europe after the epidemic ceased.

This in itself must have proved to England the false position she had taken up, and which she still continues to hold.

This action of England in the Egyptian cholera matter is analogous to her action in the question of the Suez Canal construction—politics *versus* truth.

After the death of Mohammed Ali, and of his son, Ibrahim Pasha, the great warrior, the Egyptian sanitary service began to flag.

Abbas Pasha, who reigned from January, 1849, to 1854, had no great penchant for reform, and hated everything European.

Under his successor, Said Pasha, however, the sanitary service revived during the period of his reign from 1854 to 1863, also for a time under the ex-Khedive Ismail Pasha (1864-79) until his financial difficulties swamped everything, so that nobody was paid and nothing could be done.

At this crisis Ismail Pasha was made to abdicate in favor of his son, Tewfik Pasha, the present Khedive, who, more than any Egyptian sovereign of his line, has sacrificed his personal interest for the public good.

Under him on January 3d, 1881, the medical service of the country was reorganized and divided into two departments: I. A Quarantine Service; and II. A Sanitary Service. The duty of the Quarantine Service is to guard the ports and frontier towns against the importation of contagious diseases, and the duty of the Sanitary Service is to keep the country in a good sanitary condition and supply all the medical wants of the country.



The Quarantine Service is international, and has its seat at Alexandria, while the Sanitary Service is Egyptian, and has its seat at Cairo.

Both these services had Egyptian medical men as presidents. The Sanitary Service had its budget increased from £54,000 to £60,000 a year, and it bade fair to be a success, for, under the able presidency of His Excellency Dr. Salem Pasha, a medical school, two hospitals, and three abattoirs, the intention being to construct two hospitals every year till all the fourteen provinces of Egypt were supplied with proper hospital buildings.

Each province has its hospital, with doctor and staff of servants. A chief doctor stays at the headquarters of the governor of the province, and under him are so many doctors, midwives, and barbers, according to the number of villages in the province.

The Sanitary Board, of which I was a member, proposed to have a cottage hospital erected on the Qasr el Ainee ground, for neither Alexandria nor Cairo have proper hospital buildings. Many excellent sanitary measures were proposed to the Government, which retains the executive power in its own hands, but few of them were ever carried out, and for this (*i.e.*, their non-execution) the Sanitary Board was blamed, which reminds one very much of the fable of the wolf and the lamb.

In 1882 the Egyptian Sanitary Service shared the same fate as the other administrations of the Government—*i.e.*, it was thrown out of joint by the Arabi rebellion, and scarcely had it got into working order again when the cholera epidemic of 1883 broke out at Damietta—a town that is in direct communication with Port Said and the Suez Canal through Lake Menzaleh.

It so happened that the steamers going through the canal to India frequently employed Arab firemen for the voyage there and back without putting their names on the log. These firemen have their families at Damietta, and simply sail across the lake in ferry-boats to be thus employed at Port Said, and on the return voyage, whether the steamer was passing through the canal in quarantine or not, these firemen were let down at a convenient place on the canal where they

could be ferried over to Damietta, and that without the knowledge of the quarantine authorities.

This constituted an open gate for the free importation of the malady, and as the soil of Egypt is always favorable to the propagation of an epidemic once the germ is admitted, the malady spread like wild-fire, and tested to the utmost the strength and intelligence of the Sanitary Service; and not till many of the sanitary doctors were shut up in the *cordons sanitaires* was the service obliged to accept the proffered help of England, who sent out a number of English doctors (without any knowledge of the language of the country), who were sent to the infected towns that stood most in need of them.

These gentlemen were more or less kept in hand by Surgeon-General Hunter (now Sir W. Guyer Hunter), of sad memory as far as the Egyptian medical service is concerned. He had been sent out to Egypt by Lord Granville "for the purpose of investigating and reporting as to the origin of the cholera and the best means of its repression." Instead of acting up to his public instructions he immediately on his arrival in Egypt declared openly that the British Government had sent him to announce that the epidemic had taken its origin in Egypt, and had not been imported, and he challenged any one to contradict him.

This reminds one somewhat of a famous Spanish king, who, in sending out his ambassadors to the various nations of Europe, gave them both public and private instructions that were often in direct contradiction the one to the other.

Surgeon-General Hunter having taken this stand, one can easily guess in what groove his investigations would run, and what evidence he would accept or reject. It was but natural to suppose, therefore, that he would influence the newly-arrived English doctors to adopt his theory, and doctors and laymen alike, who in any way contributed to uphold Dr. Hunter's theory, were rewarded at the expense of those who had conscientiously resisted it.

His Excellency Dr. Salem Pasha, in the name of the Sanitary Board, took up Dr. Hunter's challenge, and the board consistently and intelligently asserted its opinion, notwithstanding the repeated attempts made at coercion.

Might, however, prevailed against right, and Dr. Salem

Pasha and all the members of his board were summarily dismissed (February 13th, 1884) by a British agent, who failed to get the signature of the Minister of the Interior to legalize his documentary missile.

This is the way in which public business is still managed in Egypt. There is a great display of might, but very little right. I refer more particularly to the medical department, as I am not supposed to know anything about the other departments.

When the Sanitary Board's death-warrant was served, permission was asked by the board to finish their report on the cholera epidemic, already nearly completed. This was refused point-blank, and the succeeding boards and administrators have failed to produce it. This much-to-be-regretted gap in the medical history of the country was in part bridged over by the British Consul at Cairo, who is a man of little-appreciated capacity by the powers that be. He wrote an excellent report not only on the cholera epidemic of 1883, but of all the various cholera epidemics that have afflicted Egypt. His report was printed at his own expense, and copies sent to the British Foreign Office, and permission asked to have other copies distributed among his friends. Up to this time permission has not been granted, and probably the book has been pigeon-holed, as the facts related in it did not favor the views adopted by the British Parliament, "the average intelligence of the members of which cannot soar higher than parochial and trade interests" (Huxley).

Dr. Salem Pasha's Sanitary Board had but a very short existence—from January 3d, 1881, to February 13th, 1884—yet it could point to a considerable amount of good, honest work achieved under most trying circumstances, for besides the amount of time spent in organizing the service, that organization was broken up by the rebellion of 1882, and much interfered with by the cholera epidemic of 1883.

The native doctor, President of the Quarantine Board at Alexandria, having favored Hunter's theory, was rewarded for his patronage by being appointed director of the new sanitary administration, which has the same fault as the former board—viz.: no executive power. An English doctor who had only a few months previously come to the country was

appointed sub-director, but this arrangement was very temporary, for after twelve months both these gentlemen were replaced by an Egyptian layman and an English surgeon-major from the army of occupation, neither the one nor the other having any practical knowledge of sanitary affairs.

The Egyptian layman, an intelligent and honest man, very soon sent in his resignation—and that for reasons not very creditable to the service—and although his successor had been designated by the Egyptian authorities, yet for some reason or other he was not appointed ; so the surgeon-major fills his place, and is now solely responsible for the administration of the Egyptian Sanitary Service.

From a lack of knowledge of the country, its people, and system of government, this administration has endeavored to deal with Egypt in sanitary matters in accordance with the rules and regulations of a European country, without having adopted the necessary measures to prepare the ground for the European seed. The result has been more or less fruitless.

The capitulations have been blamed for standing in the way of reform, but the capitulations are absolutely necessary for the protection of the different nationalities when there is a lack of honesty in the administration of the country.

At Cairo the Government has a medical school that grants degrees in medicine and obstetrics, and it is from this school that the Sanitary Service is recruited ; but until recently nothing had been done to keep the native medical man up to the times after he had finished his studies at the medical school.

As there was no appearance of the Government authorities taking any action to fill up this lacuna in the medical education of the natives, a few of us private medical practitioners, both native and European, who take an interest in the welfare of the country and in the advance of Egyptian medicine, formed ourselves into an Editorial Committee, with Dr. Schmeil (a clever and energetic Syrian physician) as chief editor, and for the past eighteen months we have published a monthly medical journal in the Arabic language which numbers forty pages, and a specimen of which I now show you.

It contains original articles dealing with matters of local medical interest, and excerpts from European medical journals.



The effect of this publication is already manifest, for when I left Cairo, in August last, the sanitary administration was about to bring out a journal of its own, and when in private audience with the Khedive before I left Alexandria, His Highness promised to support both these medical journals.

This I consider is a great step in advance for Egyptian medicine, and I have much pleasure in acknowledging here that the ground had been in part prepared for us by the scientific Arabic journal *Magtataf*, which has been published for the last eleven years by two learned Syrians (Messrs. Nimr and Saroof).

This journal enjoys a wide circulation, and was for a long time the only medium through which we could reach the native medical man, and we always found the editors willing and even anxious to have our medical and sanitary articles to insert in their journal.

Of course the *Sheffa* and the *Sata*, which are purely medical and sanitary, will now draw out all our energies, so that what would have formerly been printed in the *Magtataf* will now be published by the above two medical journals.

Our great aim is to educate the natives up to the sanitary reforms that are urgent, and to keep the native practitioner *au fait* with European medical science, and we expect to get still more assistance in this from the Egyptian Public Instruction Ministry.

DENGUÉ IN SYRIA, by Dr. WORTABET, which, in the absence of the author, was read by Dr. Grant (Bey), was in substance as follows :

Epidemic of dengué in 1883 was supposed to arise from local causes, as it could not be traced to importation. It spread by contagion. Began at Latakia, and from that town spread to the principal towns of Syria. Everybody attacked who was exposed to the infection. Prevalent during the moist season of the year. Requires both heat and moisture for its propagation. It did not make its appearance at any great height on the Lebanon unless when it was carried there from the low country, and then did not spread to others, but simply affected those who had imbibed the poison before going up the mountain.

Rains and thunder-storms had no appreciable effect on the malady.

Several epidemics of this malady recorded in Syria and in Egypt.

This malady has never been noticed in Upper Egypt, where the atmosphere is much drier than it is in the neighborhood of the Delta.

An epidemic of it in Malta and Gozo in 1878, but not recognized by name at the time.

Probably imported in that case from India.

The mode of invasion and the symptoms of the disease were fully described, and need not be mentioned here.

At Beyrout in 1883 the dengué was almost universal.

The following observations were made on the main symptoms of the disease :

1. The articular *pain*, which has given this fever its distinctive name of dandy, dengué, knee-fever, and break-bone-fever.

2. The *fever*, which continued from three to five days, but occasionally exceeding that number of days.

Sometimes a sort of relapse about the sixth day.

3. The *eruption*, not always present, and when present not always presenting the same appearance ; sometimes it was papillary, like measles, and sometimes erythematous, like scarlatina. In every case the color was more or less red.

Dengué is therefore an exanthematous fever.

4. Digestive functions impaired, bowels always constipated, except in some cases that manifested an irritability of the alimentary canal, with vomiting and diarrhœa.

This has led some medical men to divide dengué into two classes—a rheumatic and a gastric. This is a mistake, as the gastro-intestinal derangement is accidental, owing to a previous biliary disturbance.

5. The *universality* of the epidemic, sparing no age.

In no case could death be directly traced to it, although deaths resulted from other causes set up by the dengué poison.

Perspiration was always a sign of the breaking up of the fever, but never so well marked as in intermittent-fever.

6. The *infectiousness* of dengué is unquestionable.

The medium of infection is more the air than contaminated water, but what the *contagium vivum* is I could not discover.

Blood examined under the microscope revealed no disease-germs, although there was an alteration in the corpuscles. Dengué-fever is one of the most infectious of diseases.

Incubative stage difficult to get at, but ranged between two and ten days.

From the history of this disease it would appear that the most favorable if not essential condition for its importation and propagation is a warm and moist climate.

This explains why Europe, with the exception of Spain, has been spared a visitation of this eruptive fever.

The treatment of this fever has to be more or less symptomatic.

Emetics and saline purge, hypodermic injection of morphine, or a dose of chloral to mitigate the pains and secure sleep.

Quinine or some tonic to help on the convalescence.

JOHN WORTABET, M.D.

*Note by Dr. Grant Bey, the reader of the above paper.*—Surgeon-General Maclean's treatment with aconite and belladonna referred to, and frictions with belladonna and chloroform liniment.

Quinine and salicylate of soda had no beneficial effect during the acute stage in the epidemic of 1880 in Cairo.

Many cases required nothing but an emetic of tartarized antimony and ipecac, followed by a mercurial purge. History of dengué in Egypt was same as that in Syria.

Two cases of undoubted communication of the malady by infected soldiers were described.

Next followed a paper on

"THE PLACE OF SANITARY SCIENCE IN EDUCATION," by Dr. A. W. LEIGHTON. It commenced with the quotation of Guizot's law that "The superiority of modern civilization consists in the unprecedented *variety* of powerful competitive forces that now hold sway," and Andrew White's "fear that the mercantile spirit is dwarfing other elements of strength in the United States."

The complicated conditions of life now demand a larger

knowledge of hygiene than ever before to check the excessive modern reaction against moral training ; to curb some of the murderous tendencies of greed and some of the suicide tendencies of ambition ; to elevate and give a new significance to citizenship, to the idea of municipal government, and to the idea of international brotherhood.

The first half dozen years are the parents' absolute charge. If adequate notions have ever been entertained by young people there must first have been an initial introduction to simple phenomena and elementary ideas underlying those conceptions.

The exigencies of individual life simply emphasize the verdict of sociology against the domination of a single idea in education ; enhances the significance of every effort to produce in available shape the elements of a science of health, domestic and public, as well as personal.

A popular text-book, however, should not show too prominently the ear-marks of a radical temperance faction.

The growing debility of some families and people, the pathology of crime, and the physical basis of poverty offers as interesting a field for selection as can be found, as useful a vocabulary, as wide a scope for linguistic analysis, for elocutionary effect, for collateral observations and composition.

He invoked the aid of the correspondence schools, the "Chautauqua Circle," "the Correspondence University of Chicago," etc.

Public libraries have a part to take. The sanitary studies which the common schools inaugurate, the college should follow into their higher and wider applications. Any treatment of the subject from the university standpoint should include : First, a specialist ; second, a collection of typical sanitary appliances ; third, a well-stocked sanitary library, which in America is one of the rarest advantages. When the press emulates the standing set by its better representatives, sanitary science stands ready to purify its columns. The preacher should lose no opportunity to brand the avarice or stupidity that precipitates public or private wreckage, as he believes it should be branded, a case where sanitary science overtops the province of morals and extends the significance of both.

The session closed with an elaborate paper by URIAL R. MILNER, M.D., on



“PRACTICAL AND COMMON-SENSE VIEW OF PUBLIC AND INTERNATIONAL HYGIENE.” He sketched in a general way a broad field of work, but summed all up in the concise statement that, for the prevention of malarial diseases in all phases, yellow-fever, typhoid-fever, dengué, and many others might be added, all things else combined were not equal to thorough drainage, sewerage, and the proper disposal of surface filth.

*Third Day, September 8th.*—The first paper read was

“SOME POINTS ON THE GROWTH OF PREVENTIVE MEDICINE IN GREAT BRITAIN,” by Dr. BENJAMIN WARD RICHARDSON, of London. In the absence of Dr. Richardson, his paper was read by the President. Reference was made to the great reform effected in the hygiene of prisons initiated by the immortal Howard, which, under recent progress, had become synonymous for sanitary domiciles, so effectually have infective diseases of every kind been banished from them.

Preventive medicine in Great Britain has been greatly promoted by the military service. In the Crimean war especially the most important steps were taken, and success attained. Soon afterward action was taken for the general appointment of sanitary officers in civil life ; but antecedent to this action, as the first half of the present century drew near its close, administration under the designation of the “Poor Law” commissioners of inquiry into the preventable causes of disease were appointed, which resulted in numerous organizations throughout the kingdom.

Foremost among the promoters of this service was Edwin Chadwick, under whose influence practical sanitation exhibited such signal advances as to have resulted in making it essentially a department of the Government. The lessening of the death-rate was referred to, showing a reduction during the last fifty years of nearly fifty per cent in the military service. The reduction was almost equally well marked in civil communities. In India it had been reduced in both civil and military life to less than one half what it was half a century ago.

The various manufacturing establishments had also participated in the general benefit. Still there remains much work to be done. The death-rate is yet too large. This was verified by quoting freely the statistics of the late Dr. Farr, mak-

ing special reference to the different ratios of life-expectancy pertaining to different ages and avocations. The next paper was

“VACCINATION IN YELLOW-FEVER,” by Dr. DOMINIGOS FREIRE, of Rio de Janeiro, Brazil. It was first read by the author as written, in French, and then in English by Dr. G. R. Le Mounier, French secretary of the section.

On its conclusion the author exhibited numerous microscopic specimens of the yellow-fever microbe, after which the morning session adjourned.

Dr. FELIX FORMENTO, one of the secretaries of the section, kindly furnished us the following abstract of Dr. Freire's paper :

After speaking of the microbe and its botanical character, and reaffirming the discovery of its invariable presence in the blood of yellow-fever patients and its transmissibility to lower animals, he spoke lightly of the methods used by him for obtaining its gradual attenuation until it reaches the point of becoming no longer a deadly poison, but a protective agent, a vaccine against future attacks of yellow-fever.

He stated that inoculation in a healthy subject of the modified or attenuated virus, according to Pasteur's method, produces all the symptoms of the disease, high fever, infra-orbital pains, sometimes vomiting, and slight jaundice, but all these symptoms of disease disappeared without medication in the space of two or three days, and there was no example of more serious symptoms of death occurring after this preventive inoculation of yellow-fever.

He gave the results of his inoculations as follows :

Vaccinations practised in 1886.....	3,473
Vaccinated who have died.....	7
Vaccinations practised in 1885.....	3,051
Vaccinated who have died.....	1
Total vaccinated.....	6,524
Total deaths.....	8
Death-rate.....	0.1 per 100

Mortality among the not vaccinated (official report) for 1885 and 1886, 1667, many deaths being attributed to other diseases, malarial, etc.

Most of the persons vaccinated were of the lower classes, living in bad sanitary conditions, and all were liable to contract the disease, being either foreigners or not acclimated.

The number of those who were vaccinated from the age of a few months to 10 years was 1491 ; from 11 to 20, 606 ; from 21 to 30, 527 ; 31 to 40, 391 ; 41 to 50, 296 ; 51 to 60, 133, and above 60, 29.

The statistics show the absolute innocuousness of inoculation even in young children, and that the highest number of vaccinations took place among those who, from their age, were most disposed to contract the disease from a few months to thirty years.

The paper elicited marked attention throughout, and an animated discussion, which resulted in the following action :

WHEREAS, inoculation against yellow-fever, if it proves unsuccessful after further examination, is calculated to benefit the human race throughout the world ; and,

WHEREAS, the facts presented by the experiments of Dr. Domingos Freire affords a reasonable assurance of its protective influence,

*Resolved*, That this Section recommends the co-operative investigation of the results obtained by yellow-fever inoculation as a protection against that disease, and that adequate appropriations by the governments represented in this Congress be made for that purpose.

*Resolved*, That this action be communicated forthwith for consideration in the general session of the Congress.

The next paper was

“ METROPOLITAN DEFENCES AGAINST INFECTIOUS DISEASES,” by EDWARD SEATON, M.D., F.R.C.P., London, Representative of Her Majesty’s Local Government Board on the Board for Providing Infectious Hospitals in London, and Professor of Public Hygiene at St. Thomas’s Hospital. London.

Dr. Seaton referred to the importance of the subject as an international question of public hygiene. With the rapid increase in the facilities of travel, every community became more and more dependent for safety upon the perfection of

the arrangements for isolating and preventing the spread of infectious diseases in great cities.

He then described the ideally perfect system for the control of epidemic disease and illustrated the various parts of the whole system by the experience of American cities and some of the large provincial towns in England. He then described the system in London, pointing out the essential respects in which the metropolitan defences were defective. The great difficulty in London arose from the multiplicity of authorities. There was no head to control or work the whole machinery for dealing with epidemic disease from its inception.

The need for a single board which would fill that position was being felt more and more, and the asylum's board, of which he had the honor of being a nominated member, and the board which provided for the infectious hospitals in London, was coming to be regarded as the suitable authority for this purpose. He next described the constitution of that board, and dwelt upon the fact that it was mainly composed of representatives of the poor-law authorities or board of guardians. This he considered a great defect, as their members were not accustomed to the work of preventing disease, and they were in the habit of regarding the provision of asylums or hospitals for the poor who were attacked with infectious disease as their legitimate function.

Notwithstanding the defects in its constitution, the board has achieved a great work. The establishment of the present infra-mural and extra-mural infection hospitals was the work of the board, as was also the present admirable ambulance system. He exhibited maps of London and its environs, showing the position of its hospitals and the arrangements for the removal of patients both by land and water. There are five hospitals, situated in the east, south-east, west, north-west, and south-west parts of London, providing beds for 1472 cases. The extra-mural hospitals consisted of the ships *Atlas*, *Endymion*, and *Australia*, situated at Long Reach, fifteen miles down the river, which provided 350 beds for small-pox.

There was also a large convalescent home for scarlet-fever at Winchmore Hill, on the north side of London, for 416 patients. The questions which at the present time most urgently require the attention of the London Board are the



need for a law requiring the notification of infectious diseases, and the best means of dealing with severe cases of small-pox, which could not be moved safely to a great distance. Professor Burdon Sanderson had suggested to the Royal Commission on Small-pox Hospitals, which sat in 1882, the erection of hospitals constructed to consume their own air.

Next followed a paper by the President, Dr. JOSEPH JONES, entitled an

“OUTLINE OF INVESTIGATIONS RELATING TO THE CAUSATION AND PREVENTION OF ENDEMIC AND EPIDEMIC DISEASES, AND MORE ESPECIALLY MALARIAL-FEVER, DURING A PERIOD OF THIRTY YEARS, WITH A CLAIM FOR THE COMPREHENSIVE DEMONSTRATION OF THE CHEMICAL, MICROSCOPICAL, AND PATHOLOGICAL CHARACTERS OF THE BLOOD AND ORGANS IN MALARIAL-FEVER, AND THE APPLICATION OF THE RESULTS OF THESE INVESTIGATIONS TO THE DIAGNOSIS OF DISEASE AND TO MEDICO-LEGAL SCIENCE.”

It consisted of a detailed statement of extended observation and investigation for a period of years, of the condition of the blood in malarial-fevers in comparison with other diseases, showing especially the destruction of the colored blood corpuscles in malarial-fevers. He also compared these results with microscopical observations of the blood corpuscles in yellow-fever, and with the results of injecting “swamp” water into the circulation, demonstrating its poisonous effects. From this he proceeded to sketch a large field of investigation of the chemistry of soils of different localities, and the relation of soils to malarial diseases. He also stated that in 1863 he discovered and published the first description of the microbe of typhoid-fever. The paper was a long one and not wholly read, but replete with microscopic and other investigations of much practical importance not hitherto published.

*Fourth Day, September 8th.*—The first paper was

“FACTS AND THEORIES RELATING TO THE CAUSE, NATURE, AND PREVENTION OF MALARIAL-FEVER,” by Dr. TOMMASI CRUDELI, of Rome, Italy, which was translated into English and read by Dr. Felix Formento, and to whom we are indebted for the following abstract :

In 1879 Klebs and Crudeli discovered the microbe of

malaria, since which time many researches from different observers have confirmed his views as to the cause of malaria. Among others Dr. Schiavazzi, an eminent bacteriologist.

The results of Dr. Schiavazzi's researches confirming Crudeli's discovery are as follows :

1. The constant presence of a bacillus morphologically identical with that described by Klebs and Crudeli under the name of bacillus malaria, in the malarial atmosphere of Polo, and its absence in the atmosphere of non-malarial regions.

2. That inoculation of pure cultures of this bacillus fever in rabbits produces fever, with all the characteristic anatomical and clinical symptoms of malarial-fever.

3. That the blood, spleen, and lymphatic abdominal glands of those rabbits being placed in favorable condition of development, furnishes an abundant vegetation of bacilli morphologically identical with those which infected the rabbits.

4. That in animals infected by pure cultures of this bacillus the red globules of blood undergo those alterations which have been described as characteristic of malarial infection.

From the above Schiavazzi draws the conclusion that the bacillus found by him is precisely identical to the bacillus discovered by Klebs and Crudeli in 1879, and that it is really the cause of malaria.

He further declares that malaria increases in proportion to the development and presence in the air of this bacillus.

Crudeli passes in review the different prophylactics that have been recommended against malaria, particularly quinine, alcohol, salicylates, the tincture of eucalyptus, and arsenic. But quinine is expensive for the poorer contadini (peasants), and in the long run disturbs the digestive and nervous functions. The salicylates, when pure, are also expensive, and observation has not proved their real efficacy as preventive. Tincture of eucalyptus is useful (as all alcoholic stimulants), rendering more active the circulation, and may have succeeded in regions of country where malaria is not very severe ; but it does not succeed in badly-infected localities, such as the Fontana, where terrible epidemics prevailed in the years 1880, 1882, and 1886, in spite of generous, free distribution among the people of a well-prepared tincture.

He gives the preference by far over all other prophylactics to

arsenic (arsenious acid), which possesses more permanent anti-malarial action, costs but very little, improves nutrition, and can be administered without difficulty even to young children.

The preparation which is recommended, especially among ignorant persons, is that of accurately-dosed gelatine tablets, each containing two milligrammes of arsenious acid, and can be easily detached one from the other like postage-stamps.

These gelatine tablets are easily dissolved in coffee, wines, or soup, as we all know. Arsenic should never be given on an empty stomach. It should be given at the dose of two milligrammes a day for adults, to gradually increase to twelve and more. It may be given without danger for three or four months at a time, with occasional short intervals during the period of danger from January to September.

Arsenic may be administered under a different name. Its efficacy as a prophylactic against malaria has been demonstrated by numerous (over one thousand) observations among the contadini soldiers in garrison, railroad employés, etc.

“THE INFLUENCE OF CLIMATE IN THE PRODUCTION OF CHOLERA-INFANTUM,” by Dr. GEORGE MAXWELL, of Florida, was then read.

Dr. Maxwell drew largely but differed from the writings of Dr. N. S. Davis, of Chicago, President of the Congress, to show that, in his judgment, the causes usually assigned for the production of cholera-infantum, as poor and changed milk, impure air, unhealthy and poorly-fed mothers and nurses, dentition, etc., were not the proximate factors; that these causes are in operation as well in winter as in summer; whereas Dr. Davis attributes it to high heat continued through at least five successive days and nights. July is the month in which, as Dr. Davis clearly proves, three fourths of the cases have their initial symptoms or beginnings, and it ought therefore to show the long-continued succession of hot days and nights and stagnant air in a degree greater than other months. But the records show that August has all those meteorological factors in a greater degree than July, yet there are almost invariably as many sudden great decreases from the total of the former both in the number of cases and deaths.

Another mistake made by Dr. Davis, and all other writers

upon the subject, is that it is a disease of large, compactly-built, unsanitary cities, when facts occurring under the writer's observation, and derived from others show that it is as prevalent, and even more fatal in small towns, villages, and even upon isolated farms, than in the large cities. He cited a terrible fatality which had fallen under his observation one summer in a country town of twenty-five hundred inhabitants in New Jersey, where there were forty-seven deaths of infants from this disease.

The cause, he contended, is yet unknown ; but it is reasonable, in the present stage of etiological science, to say that it is a micro-organism which has yet to be discovered. Cholera-infantum, he claimed, is a specific disease having a specific cause, which produces that disease and nothing else. And that it is active in being and in propagation at the heated term in midsummer is not more remarkable than that flowers should have their time to bloom and fruits theirs to mature.

He claimed that it is a climatic disease, which belongs to certain territorial areas ; that as yellow-fever finds its home in tropical America, and cholera its nidus in India, so cholera-infantum makes its habitat in the Northern and Eastern States of this Union.

The disease, as Dr. Davis has shown, is prevalent to a comparatively slight degree in New Orleans and San Francisco, and the writer shows that it is even less known in most of Florida and lower Georgia. Ocala, where he has lived six years, has not had in that time a single case, and in Orlando, as in many other towns, it is said by the health officers to be "almost unknown." Ocala has a population of 2500, and Orlando 5700.

Dr. Maxwell believes that when the facts are known mothers at the North will be induced by their medical opinions to take their young children and infants to the far South, as the middle-aged come in winter for pulmonary complaint. He also offered simply as a suggestion that the universal use of the "child's carriage" had increased the mortality from the disease, as it was universally known that every slight agitation of the body in case of any irritation of stomach and bowels proved hurtful. He is confident that he has seen death



hastened and made inevitable from carelessly drawing children in these carriages over uneven sidewalks.

Dr. Maxwell's theory was sharply discussed by several members—indeed, it was shown no favor, and particularly by Dr. VAUGHAN, of Michigan, who called attention to the fact that among the thousands of children who die of cholera-infantum annually in our large cities, *only two per cent are of those nursed by their mothers*. He suggested to Dr. Maxwell that if he had extended his inquiries with regard to the milk supply of the country town to which he had referred, he would probably have found that safeguards for its purity were wholly lacking, and that the subjects of the disease in question were those infants who were fed upon it, as was the case in other and larger populations.

Next followed a paper on

“CLINICAL HISTORY AND TREATMENT OF MALARIAL CONTINUED FEVER, ESPECIALLY AS OBSERVED IN TEXAS, AND ITS DIFFERENTIATION FROM ENTERIC-FEVER,” by B. D. TAYLOR, M.D., Assistant Engineer, United States Army.

This fever, he said, is of malarial origin, but is also a fever of acclimatization, and is partly caused and certainly aggravated by intense and long-continued heat. Does not occur north of the thirty-sixth parallel, but especially prevails in Southern Texas, some portions of Mississippi, Louisiana, and Arkansas. Occurs from July to October, inclusive; *two* cases observed in January, but never saw it in February, March, April, or May, and very seldom in June. Is often mistaken for enteric-fever, but hope to show that it has distinct diagnostic features, by means of which it can be readily distinguished from that affection. Its onset is generally sudden, with marked chill, accompanied and followed by muscular and arthritic pains, nausea, vomiting, yawning, stretching, and severe headache; often tenderness over liver, spleen, and stomach; *tongue broad, thick*, covered with a *heavy* white coat, and indented on its edges by the teeth. Temperature rises at *once* to  $103^{\circ}$ ,  $104^{\circ}$  F., or more, and on convalescence swings back below  $97^{\circ}$ , and often to  $95^{\circ}$  or  $96^{\circ}$ . Pulse bears no relation to temperature, being often under one hundred when the latter is over  $104^{\circ}$  F. Tongue changes its character

in third week, and becomes *brown, dry, cracked*, with sordes on lips and teeth. Insomnia and cephalalgia, often severe, and the latter amounting to cerebral congestion, accompanied by delirium. Duration, twenty-eight days on an average, not less than twenty-one, and not more than forty-two; was sick thirty-seven days with it myself.

Distinct from enteric-fever—onset being either sudden, with chill, or preceded by one or two attacks of quotidian or tertian intermittent. Temperature at once rises to  $103^{\circ}$  or  $104^{\circ}$  F., while in enteric it only reaches  $102^{\circ}$  or  $102.5^{\circ}$  F. after first week; in enteric, chilly sensations *only*, and malaise for several days before patient takes to bed. Temperature erratic in malarial continued fever, while regular in enteric; tongue in enteric *red, narrow, pointed*, and covered with brownish or fawn-colored fur, in striking contrast to *broad, thick*, indented, and white-coated tongue of malarial continued fever. Nervous symptoms and *tongue in third week of malarial continued fever only* points of resemblance.

In malarial continued fever no tenderness in right iliac region, no tympanites, no gurgling, no diarrhœa, while these are all present in the other. Prognosis good—only lost *one* case in four years. Indications for treatment. First, keep secretions free with Syr. Rhei Arom., Liq. Ammon. Acetat, Spts. Etheris Nitrosi, iom. each every four hours.

Second, allay nervousness and produce sleep with Potass. Bromidi and Hydrate Chloral, aā fifteen to twenty grains at bed-time.

Third, above all, keep down the temperature with *cool* baths and *cool* sponging. Take temperature every two hours, and when over  $103^{\circ}$  use bath from five to fifteen minutes at  $80^{\circ}$ – $84^{\circ}$  F.; when below  $103^{\circ}$  and over  $100^{\circ}$  F., use sponging. Be careful to keep patient's head *wet* while in bath, and to take him out as soon as he complains of feeling chilly. *Quinine* of no use in this disease as an *antipyretic*, but valuable as an *antiperiodic* during the *morning* intermission, which marks the breaking up of the continued fever.

Fourth, keep the patient well nourished with such easily-digestible substances as may suit his taste and stomach—preferably *milk*. Stimulants in *third week*, but *not before*, unless indicated by feebleness of pulse.

Sequelæ of Disease : Often great muscular and nervous weakness, the *former* amounting to paralysis in some cases, and the *latter* to acute mania or melancholia, lasting a greater or less time, according to the severity of the attack. Most cases have seen die were treated with early stimulants and large doses, of quinine.

Next followed

“THE HISTORY, PRACTICAL APPLICATION, AND EFFICIENCY OF STEAM AS A DISINFECTANT,” by A. N. BELL, M.D.

Dr. Bell gave a synopsis of what he had heretofore published on the use of steam as a disinfectant, and how it was first applied on board the United States Steamer Vixen, of which he was the medical officer, near Vera Cruz, in 1848, for the destruction of vermin while she was infected with yellow-fever. He observed that within a few weeks thereafter it had at the same time destroyed the fever infection, for which reason he shortly afterward had it applied to another vessel for the special purpose of disinfection.

In both these instances steam was applied by means of a leather hose coupled with the steam-cock of the boiler, and kept up for about two hours, until the hose in immediate contact with the boiler was so charred that it would no longer sustain the pressure.

The first surprising effect noticeable on going below was the complete dryness of all exposed surfaces, and the mass of dead cockroaches with which the lower deck was covered ; they had been driven from their recesses to die in the “country ;” the steam had thoroughly penetrated every crevice.

He next described the application of this knowledge to the floating hospital of the New York quarantine in 1856 and 1859 ; and to the Quartermaster’s steamer Delaware in 1862, while he was in charge of the floating hospital for the care of yellow-fever in the lower bay of New York, and quoted an official report to the Navy Department of its effectual application to the United States Steamer Don, Commander Chandler, in the West Indies, in 1867.

He gave an abstract of various experiments under his direction in 1862-’66, illustrating the facility with which steam may be applied to vessels, merchandise, buildings, and clothing ;

and quoted from a report that he had made to the Medical Society of the State of New York in 1864, summarizing his conclusions based on observations previous to that time, that a temperature of  $145^{\circ}$  F. effectually disinfects the worst fomites.

This was followed by quotations from the most recent writings of Dr. Sternberg and his latest conclusions that, "a temperature of  $143.6^{\circ}$  F. is fatal to all of the pathogenic and non-pathogenic organisms tested, in the absence of spores (with the single exception of *sarcina lutea*, which, in one experiment, grew after exposure to this temperature)". That "the cholera germ of Koch does not form spores, and there is good reason to believe that the same is true as regards the germs of yellow-fever, of scarlet-fever, and of small-pox"—conclusions approximately coincident with his observed results of the practical application of steam as a disinfectant twenty-five years ago.

He next proceeded to describe, with illustrations, recent apparatus for the disinfection of baled merchandise, such as rags, cotton, etc., and his observations of their use during the last two years. He read a letter from Dr. Joseph Holt, President of the State Board of Health of Louisiana, describing the apparatus for the application of steam devised by him and in use at the port of New Orleans, and closed his paper with the following conclusions :

1. That steam at a temperature of  $220^{\circ}$  F., for ten minutes, or at  $145^{\circ}$  for two hours, is fatal to all known disease germs.
2. That the various devices and facilities for the application of steam for the purpose of disinfection are abundant, and may be safely left to the direction of those whose duties require their exercise.

Dr. M. P. REDARD, of Paris, in support of Dr. Bell's paper on the disinfecting properties of steam under pressure, said that all chemical disinfectants are unreliable. The only certain, efficacious and speedy disinfectant capable of destroying all micro-organic life, all virulence, is steam under pressure at a temperature of  $105^{\circ}$  C. and upward.

"REPORT ON THE SANITARY INSPECTION OF PASSENGER COACHES," by Dr. R. HARVEY REED, was the next paper



read. It was based on personal investigation of American railway cars.

Among the more important facts shown were the imperfect and unsanitary means of heating and ventilating passenger coaches. He had observed a difference of 30° F. between the temperature at the floor of the car and at the level of the head, and in almost all cases a great excess of carbon dioxide in the atmosphere of the car. He recommended the use of an air pressure by means of an air-pump on the engine forcing cool air into the cars opposite each seat, and at the same time hot air supplied by warmers under the floor, so protected as to be devoid of danger in case of derailment.

He condemned the air-brake as dangerous, and recommended instead automatic brakes. He condemned the use of gas and lamp, and recommended incandescent light as being safe and efficient. The water-tanks were frequently found foul, and in several instances baby-diapers and other filthy rags had been found in them. He recommended water-tanks and refrigerators with double tops, under lock and key, and that the ice be placed around a porcelain water-tank, and not in the water-tank, as it usually is.

The paper was chiefly statistical, profusely illustrated by diagrams and charts, elucidating facts of great practical importance promotive of health and safety in railway travel. On its conclusion the following preamble and resolution were adopted as the sense of the section :

WHEREAS, the whole community has been shocked by the almost daily occurrence of terrible accidents on many of the railroads, causing considerable loss of life, and by the habitual neglect of the most elementary sanitary laws ; and

WHEREAS, the section considers itself in a degree the guardian of public health : Be it

*Resolved*, That the attention of this Ninth International Congress be respectfully called to this most important question, and that it be requested to use its influence to obtain the necessary reforms.

The President said that it called for no vote, and he hoped the Congress would give all its influence to the matter.

“SOIL DRAINAGE AND OTHER METHODS IN THEIR RELATION TO THE DEVELOPMENT OF MALARIAL-FEVER,” by

THOMAS HERBERT, M.D., was next read. Three practical questions were enforced that are embraced under the sanitary view of the subject. First, drainage; second, when practicable, the filling up of low-lying places, and, third, flooding sometimes, as an occasional means of prevention, as illustrated by overflows and rice-flooding.

“THE RELATION OF PREVENTIVE MEDICINE TO MEDICAL JURISPRUDENCE,” by W. L. SCHENCK, M.D.

The object of the paper, the author said, “is to show the intimate relation and interdependence of preventive medicine and medical jurisprudence, called by the Germans ‘State Medicine.’ ”

Preventive medicine not only demonstrates the causes that produce those pathological expressions that tend to death and the means whereby they may be prevented, removed, or modified, but demonstrates as well the duty of the Legislature in providing to this end the necessary legal enactments.

Medical jurisprudence is the superstructure erected on the firm foundation of preventive medicine for the protection of the dearest interests of the citizen—his right to “life, liberty, and the pursuit of happiness”—and the harmonious development of his physical, intellectual, and moral powers.

In the interest of humanity the devotee of science demonstrates the laws of life and health as well as of diseases and its prevention; and the legislator who refuses to crystallize this knowledge into laws for the protection of the people should be held by the people responsible for every life that might have been saved had the State given to sanitarians the power to apply their knowledge.

*Fifth Day, September 9th.—*

THE DANGER OF CANNED GOODS TO PUBLIC HEALTH was the subject of a brief paper, or, rather, letter, by Dr. LADMIRAULT, which was read in English by Dr. FORMENTO. It recognized the usual danger from possible poisonous solder, and the results of putrefaction consequent upon the non-expulsion of air in closing the cans or too long keeping.

Dr. M. K. TAYLOR, United States Army, remarked upon and took issue with the views expressed by Dr. Crudeli’s paper, read on the previous day, in so far as he claimed that

malarial-fevers originate in exhalations from the ground and leave out the influence of impure water, they are calculated to mislead the public in regard to this matter, and should not be permitted to pass without comment. The records of the army show water to be an important factor in the production of these fevers in every form ; and, further, that where a change has been made from river or creek water to pure spring water, or to distilled and aerated water, these fevers have been reduced more than fifty per cent.

Dr. W. C. COOK, Health Officer, Nashville, read a paper on "Teaching Hygiene in Schools," in which he advocated that hygiene be added to their curricula ; that medical colleges establish regular professorships. Universities and colleges should employ suitable text-books and competent medical men and sanitarians, in order to properly impress the minds of pupils. The section unanimously indorsed the sentiments of the paper, as was shown by the following resolutions, offered by Dr. Benjamin Lee :

*"Resolved,* That this section cordially indorses the suggestions of Dr. Cook's paper on the necessity for the teaching of hygiene in schools, and recommends to the Congress the passage of the following resolution :

*"Resolved,* First. That it is the sense of the Ninth International Medical Congress that every medical college should place the Chair of Hygiene on its curriculum, and on an equal footing with the other regular branches of instruction.

*"Second.* That in all universities, colleges, and high-schools, hygiene should form a compulsory part of the course of study, and should be taught not simply through text-books, but by educated physicians.

*"Third.* That in all public schools the teaching of hygiene should form a prominent and essential feature.

*"Fourth.* That every State Legislature should establish a museum and laboratory of hygiene."

*"A NEW METHOD OF TESTING THE GERMICIDAL AND ANTI-SEPTIC POWERS OF CERTAIN MINERAL AND VEGETABLE SUBSTANCES EMPLOYED EXTERNALLY AND INTERNALLY IN THE TREATMENT OF WOUNDS, TUMORS, ENLARGED GLANDS, ULCERS AND SYPHILIS, AND IN CERTAIN SANI-*

TARY OPERATIONS OF DOMESTIC AND PUBLIC HYGIENE," by JOSEPH JONES, M.D., of New Orleans La., President of the Section.

The scope of the paper embraced the relative value of the agents used in the local and constitutional treatment of wounds, tumors, ulcers, and contagious diseases. The methods of conducting the experiments were described in detail, together with the botanical, microscopical, and chemical characteristics of rice, and its nature as an article of food as compared with other grains. Experiments illustrating the effects of certain poisons, germicides, antiseptics, and disinfectants upon the germination, growth and preservation of the seeds of rice, followed by a definition of terms and brief outlines of established facts relative to disinfectants and antiseptics.

He dwelt in particular on the efficiency of mercuric chloride, and the extensive use he had made of it for many years as a remedy in the treatment of malignant diseases, as an antiseptic, germicide, and disinfectant, and described the manner of using it; in its use as a disinfectant particularly he differed from those who use it in the strength of only 1 : 1000 dilution, or even in 2 : 1000; it should be stronger. Carbolic acid was also discussed with relation to its value as an antiseptic and germicide compared with mercuric chloride, which in effects it resembles. This he particularly emphasized, because he was aware that his experience in this regard differed from Koch and some other observers. The paper possessed the merit of exhaustive detail of personal investigation, which demonstrated to the author's satisfaction the truth of his own observations as compared with the observations of others at variance with him.

"A NEW METHOD FOR DETECTING THE TRICHINÆ SPIRALES IN MEAT," by Dr. J. A. CLOSE, was the next paper. The method described consists in making a solution of the suspected meat in a mixture of pepsine and hydrochloric acid, and placing the solution in a conical precipitating glass, when the liberated worms will rapidly sink to the bottom of the glass, whence they can be easily removed by a pipette and examined by a compound microscope.

If a hot stage is used on the examining microscope, the



worms will be seen alive. Dr. Close claims that this is the only method of examining meat suspected to contain trichinæ, which enables the examiner to state positively that meat does or does not contain trichinæ spirales.

“THE INFLUENCE OF EASY CIRCUMSTANCES IN THE PROLONGATION OF LIFE,” by D. C. DRYSDALE, M.D., London, England, was read in abstract by the Secretary, in the absence of the author.

The author quotes statistics furnished by Edwin Chadwick, Dr. Farr, and others, showing the different death-rates in houses of good condition as against those in bad, being as 1 in 65 to 1 in 15 of the population respectively; and of villages and certain towns and parts of cities in good condition as compared with bad, the respective death-rates as 11.13 to 38 per 1000, and of the latter some even as high as 50 per 1000. Comparisons are also made with regard to infantile mortality, showing how greatly it depends upon removable conditions. Soil and house-drainage, the disposal of sewage, and a pure water supply are the *conditiones sine quâ non* of protective sanitation to all cities and villages. The paper altogether is remarkable as a condensation of the most important facts illustrating the contrasts between results of practical sanitation and the neglect of such service.

The time for adjournment having arrived, the President called the attention of the section to several papers still before it which had not been read, and in particular to one on “CREMATION,” by Dr. FELIX FORMENTO, which seemed to suggest the importance of another session. But, on motion, it was voted that all papers which had been read before the section be indorsed by the section and recommended for publication entire in the proceedings, and that all which had not been read be read by title, and referred to the Executive Committee with power. Thanks were voted to Dr. N. S. Davis, President, and to the Executive Committee for their efforts, which had so signally contributed to the success of the Congress.

A resolution of thanks was offered by Dr. A. N. Bell, and cordially supported by all present, who had identified themselves with the section, to the President of the section for his

assiduity in the procurement of so many valuable contributions, and for his devotion to its interests.

Remarks on this resolution elicited the statement, by Dr. GRANT (Bey), of Egypt, that he had been urged by some, whom he thought eminent in the department of State medicine, not to attend the section, for which, however, he had no satisfactory reason. He expressed much gratification that he had attended, because it had afforded him the opportunity of participating in work which he believed second to none in the same department of any previous Congress. His statement of having been so advised roused the deserved expression of indignity by several members present that there should be professed devotees to sanitary science with so little sincerity, when put to the test, as to allow personal pique to outweigh it.

The resolution of thanks was adopted unanimously, and the section adjourned *sine die*.

For the following abstract of the papers read before other sections we are under obligations to the *Medical Record*, of New York, for advance slips from its special report.

SECTION XVI.—CLIMATOLOGY AND DEMOGRAPHY. President, ALBERT L. GIHON, M.D., Medical Director, United States Navy. Secretaries, Charles Denison, M.D.; A. Wemich, M.D.; E. Berthard, M.D., and Edmund Owen, M.D.

*First Day*, September 5th.—The opening address of the President was entitled,

ON THE DOMAIN OF CLIMATOLOGY AND DEMOGRAPHY AS DEPENDENCIES OF MEDICINE.

A place was claimed for climatology as one of the sisterhood of medical sciences. The science must be taught in a manner befitting the importance of the subject. Preventive medicine, to which climatology and demography are contributory sciences, is more important than curative medicine. The views of the late Professors Austin Flint and Samuel D. Gross were quoted in support of this assertion.

The climatological study of the future must be based upon more rational methods of investigation. The mere recording

of meteorological factors is not sufficient. Determinate climatic characters are not easy to formulate. Malaria is not a climatic disease, because the cause of malaria is a removable one and within the control of man, as proved by the experience in the marshes of Savannah, the lowlands of Holland, the Maremma of Tuscany, and the Roman Campagna, whose poisonous exhalations have been converted into innocuous vapors. The drainage of the Roman marshes has reduced the death-rate of the Italian army to one third of its former magnitude. There are few specific climatic diseases. Local conditions of insanitation are more responsible for the production of diseases than the general influences of climate. By appropriate regulation of habits, clothing, and diet, the morbid effects of climate may be modified or averted, or its sanitary or therapeutic influence heightened.

The data for future generalizations must be furnished by accurate and laborious collective investigation. Vital statistics must in future be something more than mere records of so many deaths, births, or marriages. Morbidity records must form the principal data for the vital statistics of the future. To have these records accurate, voluntary effort cannot be depended upon; they must be made under governmental authority. A rational nomenclature is a necessity, if our vital statistics shall serve as the basis of trustworthy generalizations.

Dr. GEORGE H. ROHÉ, of Baltimore, read a paper upon the

METEOROLOGICAL ELEMENTS OF CLIMATE AND THEIR EFFECTS  
UPON THE HUMAN ORGANISM.

The writer stated that medical climatology presented a much more complex problem than physical climatology. While the recorded observations of meteorological phenomena must form the basis, other conditions, such as those of the soil, must be taken into account. In studying the most characteristic climatic diseases, such as cholera, yellow-fever, and epidemic dysentery, an intermediate factor—namely, the special virus of the disease—must be considered. A hot climate alone will not produce the diseases mentioned.

Sanatory or morbid effects are, however, produced by varying meteorological conditions. The effects of greatly diminished pressure upon the human organism are well known.

Paul Bert and others have shown that these effects are not merely due to the physical condition of diminished pressure, but that the relative diminution of oxygen in rarefied air is an important factor in their production. While cases of phthisis usually do well in a moderately rarefied atmosphere, the effects of diminished pressure are not always beneficial, as has been pointed out by Dr. Loomis, who warns against the danger of sending patients with heart disease to high altitudes. It is not probable that diurnal or accidental variations of pressure have any appreciable influence upon health. Investigations conducted by the writer have failed to yield any positive results.

The primary classification of climates into tropical, temperate, and polar, indicates the influence ascribed to temperature as a climatic factor. Although recent writers have attributed a determinate climatic influence to humidity, it is probable that this is of far less importance than some have supposed. The temperature must still be regarded as our best index of climate, but too much dependence must not be placed upon it. Many of the unfavorable effects attributed to moisture in the atmosphere ought to be ascribed to coincident unsanitary conditions. The sanitary or morbid effects of air-currents have not been sufficiently considered as a climatological factor heretofore.

The tendency among climatologists at present is to deny to ozone any sanitary or disease-producing influence. Hydrogen peroxide is believed to be an antiseptic agent of importance in the atmosphere by some clinicians, who also ascribe therapeutic effects to the aromatic exhalations of certain plants. Very little of a definite character is known of the effects of these conditions. Further investigation is needed. The climatology of the future must be studied upon a broader basis, and ethnological, geographical, and epidemiological data must be taken into account before drawing conclusions.

Dr. W. T. PARKER, of Newport, R. I., read a paper on

THE IMPORTANCE OF THE STUDY OF CLIMATOLOGY IN CONNECTION WITH THE SCIENCE OF MEDICINE.

He animadverted upon the prevailing want of knowledge upon climatology among physicians. The science should be



more widely studied. A number of health resorts were mentioned as combining the requisite climatic with the appropriate sanitary conditions to qualify them as resorts for the sick. A wagon-trip across the plains was recommended as one of the best means to obtain the advantages of a climatic health-resort.

*Second Day*, September 6th.—The following resolutions, submitted by the President of the section, were discussed, and, after verbal amendments, unanimously adopted :

*Resolved*, That in the opinion of the Section on Medical Climatology and Demography of the Ninth International Medical Congress, assembled in the city of Washington, September 5th–10th, 1887, it is important there should be established in every country a national department, bureau, or commission for the record of vital statistics upon a uniform basis, to include not only accurate returns of births and deaths, but the results of collective investigation by government officials of facts bearing upon the natural history of disease as manifested among men, women, and children separately, especially with regard to climatic and other discoverable causes of the several forms of disease—race, occupation, and residence being included—that necessary preventive measures may be determined and enforced for the preservation of the public health.

*Resolved*, That the Secretary-General be requested to have the expression of opinion communicated to the several governments.

Dr. CHARLES DENISON, of Denver, Col., read a paper on

#### THE PREFERABLE CLIMATE FOR PHTHISIS.

The paper was elaborately illustrated by maps, diagrams, and tables. Dr. Denison believes that the climate to be preferred for the great majority of consumptives in the United States varies from between fifteen hundred feet elevation in the North in winter, to ten thousand feet in the Southern portion in summer. Certain contraindications exist against sending consumptive patients to high altitudes. The most prominent of these are advanced age of the individual ; an excitable, nervous temperament ; valvular lesions, with rapid action of the heart ; marked and extensive emphysema ; pneu-

mothorax and hydro-pneumothorax ; active pneumonia or hæmoptysis ; high bodily temperature ; extensive involvement of lung-tissue, and similar conditions.

He takes the affirmative side of the following five divisions named in the order of their relative importance : (1) Dryness as opposed to moisture ; (2) coolness or cold preferable to warmth or heat ; (3) rarefaction as opposed to sea-level pressure ; (4) sunshine as opposed to cloudiness ; (5) variability of temperature as opposed to equability.

Dr. JOHN WILLIAM MOORE, of Dublin, Ireland, then read a paper on

#### THE SEASONAL PREVALENCE OF PNEUMONIA.

The conclusions—pneumonia has claims to consideration as a specific fever on the following grounds :

1. Its not infrequent epidemic prevalence, which is beyond dispute.

2. Its proved infectiveness.

3. Its occasional pythogenic origin in many cases.

4. Its mode of onset or "invasion," which exactly resembles that of the recognized specific fevers.

5. The appearance of constitutional symptoms before the development of local signs or symptoms.

6. The critical termination of the febrile movement in uncomplicated cases.

7. The presence of local epiphenomena in connection with the skin, as herpes, taches bleuâtres, and desquamation.

8. The development of sequelæ in some cases, such as nephritis, followed by renal dropsy and other conditions.

9. The discovery of a probable pathogenic bacillus, to which analogy points as pathognomonic.

Dr. Moore concludes his paper in these words : " The day is seemingly not far distant when we shall speak of pneumonic-fever in precisely the same way as we use the term enteric-fever at present ; that is, to signify a zymotic or specific blood-disease, manifesting itself after the lapse of a certain time—the period of incubation—by physical phenomena, objective and subjective, connected in this instance with the lungs."

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THE RELATIONS OF CERTAIN METEOROLOGICAL CONDITIONS  
TO ACUTE DISEASES OF THE LUNGS AND AIR-PASSAGES.

Dr. HENRY B. BAKER, of Lansing, Mich., read a paper on the above subject, which was illustrated with diagrams that showed curves for influenza, tonsillitis, croup, bronchitis, and pneumonia, which follow the curve for atmospheric temperature with surprising closeness.

He suggests that the explanation of the causation of these diseases has not been grasped before because one of the principal facts has not been apprehended—namely, the fact that cold air is always dry air; on the contrary, it has been generally stated that when these diseases occur the air is cold and damp. He explains that while the cold air is damp relatively, it is always absolutely dry, and he thinks that its bad effects on the air-passages are mainly through its drying effects, which can best be appreciated by reflecting that each cubic foot of air inhaled at the temperature of zero, F., can contain only one half grain of vapor, while when exhaled it is nearly saturated at a temperature of about 98° F., and therefore contains about eighteen and one half grains of vapor, about eighteen grains of which have been abstracted from the air-passages. Thus cold air, falling upon susceptible surfaces, tends to produce an abnormal dryness, which may be followed by irritation and suppuration. He claims that coryza is sometimes so caused. Under some conditions the nasal surfaces are not susceptible to drying, the fluids being supplied in increased quantity to meet the increased demand made by the inhalation of cold air. In that case an unusual evaporation of the fluid leaves behind an unusual quantity of non-volatile salts of the blood, such as sodium chloride, and an unusual irritation results; he thinks influenza is the name commonly given to this condition.

The effects which the inhalation of cold air have on the bronchial surfaces depend greatly upon how the upper air-passages have responded to the increased demand for fluids; because, if they do not supply the moisture, it must be supplied by the bronchial surfaces; in which case bronchitis results. Finally, if the demands for moisture made by cold air are not met until the air-cells are reached, pneumonia is produced.

He refers to statistics which he has published, showing that even the rise and fall of such contagious diseases as scarlet-fever, diphtheria, and small-pox follow the same laws shown to control in the acute diseases of the air-passages, and he offers the explanation that the irritations and exudations in the air-passages caused by the inhalation of cold dry air supply a nidus for the contagia, and are thus the predisposing causes of those diseases. As to whether or not pneumonia is a contagious disease he offers no evidence except that nearly all of the phenomena seem to be accounted for without the necessity of supposing a special contagium. For the abnormal accumulation of the non-volatile salts of the blood through evaporation of the fluids in the air-cells, so as to cause inflammation and exudation, time is required; therefore, he does not believe that a sudden and short exposure to cold can ordinarily produce pneumonia, except the short exposure follow or precede somewhat prolonged inhalation of cold dry air; although he thinks that lobar pneumonia may have just that causation, the reason for the chill and for the limitation of the area of the exudation being the disturbance of the nervous equilibrium associated with the more or less complete paralysis of the small blood-vessels in that part of the lungs supplied by one particular nerve, some or all the endings of reflexions of which have been suddenly exposed to the enervating influence of warmth following the exposure to cold.

*Third Day, September 7th.*—Dr. A. TUCKER WISE, of Engadine, Switzerland, presented a paper on

THE CLIMATE OF THE SWISS ALPS, WITH PULMONARY CASES  
TREATED AT AN ALTITUDE OF SIX THOUSAND FEET.

The marked peculiarities of Alpine winter climate may be enumerated as, dryness of the air and freedom from micro-organisms, mechanical irritants, and noxious gases, low temperature, plenty of sunlight, low pressure, and ozoniferous atmosphere. The results of these peculiarities upon pulmonary complaints may be stated thus :

1. By breathing aseptic air free from dust, irritation, or, perhaps, recurrence of infection by microbes in the respiratory tract is greatly lessened.

2. Vaporization of morbid secretions in the lungs takes



place, promoted by reduced barometric pressure and dryness.

3. Increased oxidation of blood and tissue from sunlight, cold air, and reduced pressure.

4. Increased quantity of blood circulating in the lungs, the freedom of the circulation being aided by extended chest movements.

5. Increased activity in the pulmonary lymphatics, and a general improvement in nutrition and glandular secretion; also an exhilarating effect upon the nervous system.

The four principal health-resorts of the Grisons, in Switzerland, are Maloja, Wiesen, Davos, and St. Moritz. The climates of these resorts are stimulating and tonic.

Twenty-three cases are related, showing great improvement during a residence of from one to sixteen months.

A paper by Dr. JOHN D. MACDONALD, Inspector-General Royal Navy, on

#### GROUND AIR IN ITS HYGIENIC RELATIONS,

pointed out the importance of the study of the atmosphere of the soil, but contained no new points of view.

Dr. P. H. BOYCE, of Toronto, Canada, Secretary of the Provincial Board of Health, read a paper upon

#### HOUSE ATMOSPHERES, OR ARTIFICIAL CLIMATES.

The points considered were the constituents of house atmospheres, their temperature and humidity, and air-currents; the effects of house atmospheres on populations, and remedies for existing evils connected with house atmospheres.

With reference to the constituents of house atmospheres, the observations of Miquel, Koch, Aitken, and Tyndall upon indoor and outdoor air were quoted. Considerable attention was given to temperature and humidity in connection with house air.

The remedies for the evils mentioned are sunlight in abundance, greater care in the construction of dwellings, foundations, and plumbing appliances, improved municipal sanitation, and the attainment of equable heating and thorough ventilation. In conclusion, it must be recognized, regarding the fatal effects of the imperfect conditions of human life under

which Indians, negroes, and many of the people of limited means exist, demand the earnest consideration of all workers in the field of climatology and demography; and since the occupations, urban residence, and limited means make it impossible for an increasing proportion of our population to enjoy the health-giving influences of rural residence and the stimulating effects of life by the ever-restless ocean, or upon the mountain-side, we shall best conceive the duties assigned to us, of making it possible for every willing citizen to so live under his own roof as to maintain a vigor unimpaired for the discharge of the work lying nearest him, and to transmit to the race that is to be a legacy of physical health.

*Fourth Day, September 8th.*—Dr. TITUS MUNSON COAN, of New York, read a paper on

AMERICAN MINERAL WATERS, WITH REMARKS ON CLIMATE.

He discussed the subject under four topographical headings: Springs of the Atlantic, the Southern Central, the Northern Central, and the Western or Pacific States. He called attention to the fact that much of the Eastern area of the country was of earlier formation than that of Europe; that, in fact, this part of the New World was, geologically speaking, the Old World, and not the New. This fact explained the comparative absence of thermal springs in the East, while the Western area, including but thirty-nine per cent of the total area of the country, yet contained eighty per cent of the known thermal springs. The range of the American mineral springs in their chemical constitution is very great, and their curative waters are as important as those of Europe. In some parts of the country, as in New Mexico and in Nevada, it is often easier to find an alkaline or a saline spring than a stream of pure water. Dr. Coan gave a rapid survey of the subject, mentioning the typical springs which are suitable for the cure of particular diseases, and at which good hotel or other accommodation can be found. He remarked upon the comparative absence of well-appointed *sanatoria*, or cures, at the American springs, and the consequent lack of systematic treatment, leading both patients and physicians to underrate the curative value of spring-treatment. Climate is an adjunct element of the utmost importance in spring treatment; and the best

climate in the country is that of California and Oregon. The climate of the Hawaiian Islands is probably the most equable that is known, at the comfortable range of about 70° to 80° F., and those islands are destined to become a health-resort for Americans.

Dr. RICHARD J. NUNN read a paper entitled,

A CONTRIBUTION TO THE STUDY OF CLIMATIC AND OTHER PECULIARITIES OF LOCALITIES WHICH DETERMINE EXEMPTION FROM ENDEMIC PLAGUES.

The object of Dr. Nunn's paper was to determine whether the extraordinary exemptions from certain diseases in Savannah are due to any special topographical or sanitary conditions in that city.

Vesical calculus, typhoid-fever, typhus-fever, puerperal-fever are absent; Asiatic cholera visited the city only once (1866); diphtheria and exanthematous diseases are mild; membranous croup is exceedingly rare; cholera-infantum is mild and exceedingly rare; cerebro-spinal meningitis has appeared but once in the city; sunstrokes are very unusual; erysipelas is not common; yellow-fever has occurred but four times as an epidemic; dengue is infrequent.

The varying death-rate between the white and black races was referred to. Between 1856 and 1860 the black mortality never reached that of the whites, while since the war the death-rate among the negroes has reached double that of the whites. The changed social condition of the black race is supposed to be responsible for this variation. Formerly the negroes were almost entirely exempt from consumption, now they are extremely liable to this disease. The same may be said of syphilis.

The following papers were then read:

"The Injurious Effects of Overcrowding in Cities," by Dr. A. Wernich, of Coeslin, Germany; "The Thermometer as a Climatological Instrument," by Major Charles Smart, Surgeon, United States Army; "Vital Statistics and Medical Geography," by Alfred Haviland, M.R.C.S., of London, England; "Western North Carolina as a Health Resort," by Dr. Henry O. Marcy, of Boston, Mass.; "Therapeutic Influences of the Climate of Southern California," by Dr. P. C.

Remondino, of San Diego, Cal., and "Short Notes on the Mineral and Thermal Springs of California," by Professor W. F. McNutt, of San Francisco, Cal.

*Fifth Day*, September 9th.—The final session of the Section on Climatology and Demography; the papers read were: "The Demographic Effects of Introduced Diseases, and Especially Leprosy, upon the Hawaiian Races," by Dr. George W. Woods, Surgeon, United States Navy; "The Native Treatment of Disease in Syria," by Professor Thomas W. Kay, Syrian Protestant College, Beirut, Syria; "Demographic Consideration of the Evils of Artificial Methods of Preventing Fecundation and of Abortion in Modern Times," by Dr. Thomas M. Dolan, of Halifax, England.

The following is a summary of the paper by Dr. Woods:

Physically and mentally, the Hawaiians were considered superior to all other Polynesian races. They are described as tall, broad-chested, sinewy rather than muscular, with lively, expressive faces, noses slightly flat and often aquiline, mouth and lips large, splendid teeth, and with bodies tattooed. They were intelligent, energetic, kind, simple, and hospitable.

Climate, soil, and general environment remained the same. Hence the altered conditions in their habits and implanted germs of disease must be looked to for an explanation of the astonishing demographic changes which a century has wrought in the Hawaiian race.

The first effect of the contact with civilization was the inoculation of the race with syphilis, which spread so rapidly that it is now often declared that the great majority of the adult population is contaminated. Then came epidemics of scarlatina, rubeola, pertussis, influenza, and variola, slaughtering thousands; and the native population, which a century ago had been estimated at four hundred thousand, was reduced to forty thousand in 1884. The extraordinary mortality has been attributed to cachectic conditions, venereal disease, poverty, bad food, licentious and vicious indulgences, including ava-drinking, opium-smoking, and excess in intoxicating liquors. Later, leprosy was introduced by the immigration of the Chinese. This disease was spread rapidly by the good-nature, social tastes, and hospitality; no fear of the disease, eating from the same dish, and passing the pipe or



ava-cup from mouth to mouth ; cohabiting with infected persons, and promiscuous and compulsory vaccination.

The first case of leprosy in a native was recognized in 1848. From the establishment of the leper asylum, on the island of Molokai, in 1865 to 1885, three thousand and seventy-six lepers were received, showing in a measure the great prevalence of this scourge. For the eradication of leprosy the following measures are recommended : Segregation of the infected, cremation of the dead bodies, and, so far as possible, all discharges, morbid and fæcal, as well as the clothing and bedding, and proper disinfection of the walls, floors, and utensils used by the living.

THE INFLUENCE OF WEATHER CHANGES ON THE HUMAN ORGANISM, was the subject of a paper by Dr. E. S. CHISHOLM, of Tuscaloosa, Ala., read before the Section in Dental and Oral Surgery. After carefully noting the influence exerted by temperature, humidity, and electricity, the author concludes that by far the greatest power over human organism is exerted by atmospheric pressure. In support of this theory he submits two arguments. The normal atmospheric weight on man is 14.7 pounds to the square inch at the sea level. The body is sustained by an equal power of resistance, wisely provided. If the pressure be less, the surface of the body will be distended, and the superficial circulation less restrained. This change can be brought about by exposure to great altitude, as well as by natural physical causes, when the circulation will be disturbed just the same. Any undue pressure on a portion of the body may then be felt. May not this disturbance of tension on soft tissues which are fixed to the bony framework of man, or where disease has a seat in periosteal and ligamentous attachments, be liable to greater inflammation ? Or when a nerve of a tooth, which in a state of health is enclosed in a bony chamber (which has no expansive liberties, nor needs them as long as health continues), becomes exposed through a small aperture ; when the normal atmospheric balance is lowered, the nerve has a tendency to be drawn through the aperture and takes on inflammation, probably followed by congestion and complete devitalization.

A report from the Pennsylvania Hospital, some years ago,

on the observation of barometric pressure in surgical operations, shows that in 259 operations the barometer was ascending in 102, descending in 123, and standing in 34. Fifty-four of the whole number were fatal, 11 having been operated on with barometer ascending, 25 when descending, and 8 when standing.

AN INVESTIGATION TO DETERMINE WHETHER THE ABSENCE OF SEWERAGE AND OF WATER-POLLUTION DIMINISH THE PREVALENCE AND SEVERITY OF DIPHTHERIA, was the subject of a paper by Dr. CHARLES WARRINGTON EARLE, of Chicago, Ill., read before the Section in Diseases of Children.

He presented the results of a study of the causes of diphtheria in localities remote from sewer-gas influence in the less thickly populated Western States and Territories. He had received communications from a large number of physicians widely scattered over this great region.

His conclusions are briefly summarized as follows :

1. Diphtheria occurs in the mountains and prairies of the great Northwest with the same malignancy as in the East.
2. And with equal virulence in vicinities remote from sewers.
3. When once introduced, the residents of damp sod-houses suffer with marked severity.
4. The infection is transported thousands of miles in some unrecognized vehicle.
5. There is abundant testimony that it follows the lines of railroads and steamers, making it imperative to increase the watchfulness and improve the methods of disinfection by railroad and steamboat companies.
6. The desirability of legal enactments obliging people of all classes to recognize their responsibility in regard to the control of contagious diseases.

Dr. W. FOSTER, of Putnam, Conn., reported the apparent connection between diphtheria and exposure to filth in two cases occurring in a town of seven thousand inhabitants, otherwise entirely free from the disease. The boys affected had been playing almost constantly for several days in and about a barn, the cemented cellar of which received sink-water and house-refuse as well as manure. Isolation and thorough disinfection prevented the spread of the disease.

Dr. F. E. WAXHAM, of Chicago, Ill., believed that diphtheria is due rather to the absence of sewers than to their presence. An impure atmosphere and the presence of filth and decomposing vegetable matter are important factors. Absolute cleanliness, which, of course, includes disinfection, is our best resort.

Dr. WILLIAM STEPHENSON, of Aberdeen, Scotland, read a paper before the same section.

#### ON THE RATE OF GROWTH IN CHILDREN.

He said : But little had heretofore been known in regard to the rate of growth in children, and nothing whatever of its clinical bearings. Many important questions arise in this connection. For instance, if a boy in a given year adds to his weight double or treble the number of pounds which he does in another year, is he on account of this increase of cell-activity the more or the less able to bear a strain, such as school pressure or physical labor ?

By combining the tables of Dr. Bowditch and those of the Anthropological Committee of the British Medical Association, Dr. Stephenson had tried to construct a standard of the rate of growth from the fifth to the eighteenth year, for all the English-speaking races.

In the charts exhibited, the graphic line representing the annual increase in weight presents a curve of similar type in girls as in boys, but differing in the times of maxima and minima. The most striking difference is seen in the fact that the maximum rate of growth occurs in girls from the eleventh to the thirteenth year, and in boys from the fourteenth to the sixteenth year.

From his study of the tables and charts the author is of the opinion that the critical and trying character of the period known as puberty, is due to the fact that the great activity of growth which occurs then makes a serious demand on the system, rather than to the fact that the reproductive organs are about to reach complete development. Reference was made to important results to be obtained from comparisons in rate of growth between children of the poor and rich, and of the professional, commercial, and artisan classes.

THE USE OF COWS' MILK IN THE ARTIFICIAL FEEDING OF INFANTS, was the subject of a paper before the same section,

by Professor VICTOR C. VAUGHAN, of the University of Michigan.

Three years ago, he said, he had isolated the active principle from poisonous cheese. He named it tyrotoxinon. Later he found the same principle in milk, ice-cream, and other articles of food. In experimenting with this poison it was found that its action on the lower animals produced the phenomena of cholera-infantum. The symptoms and the post-mortem appearances were identical. From this it is easy to understand the prevalence of cholera-infantum among the very poor, where fresh, wholesome milk is almost unknown.

Not a few medical teachers advise the prohibition of milk during the progress of cholera-infantum, basing their opinions on clinical experience. The same view had been reached by the author of the paper through a long series of laboratory experiments, which show that normal milk inoculated with a small portion of poisoned milk and kept a few hours at the temperature of the body becomes itself poisonous.

Dr. LEWIS P. BUSH, of Wilmington, Del., advocated the use of a young and healthy cow, isolated from others, as in a herd there was a possibility of the contraction of some disease which might injure the milk.

Dr. R. B. WHITE, of Ennis, presented the following rules which his experience had suggested :

1. Test with litmus, and add lime water, if required, before every meal.

2. Limit the amount given in twenty-four hours.

3. Allow only bottles large enough for a single meal, four to six in number ; those not in use to be washed in boiling water and kept in an alkaline solution or suspended in the sunlight.

4. The best nursing bottle is a two to six-ounce flask, with a rubber nipple drawn over its mouth.

5. Bring the milk to the boiling-point, and then keep it on ice.

Dr. A. E. GOODWIN, of Rockford, Ill., was in the habit of insisting on the milk of one healthy cow well fed and stabled, on boiling the milk and keeping it in a sealed glass vessel at a temperature not higher than 60° F., and diluting it with from one third to one half of water, with, perhaps, the addition of a little malt.



Dr. W. D. BOOKER, of Johns Hopkins University, stated that there can be little doubt of the injurious effects of micro-organisms upon milk, and the best way to prevent this is not to trust to keeping the milk cool, but to first boil the milk in a flask supplied with a sterilized cotton stopper or a suitable sterilizer. It can thus be set aside and kept for a considerable time in a pure condition.

He believed it was important, in considering the injurious effects of decomposing milk upon children, not to overlook the danger of other injurious articles of food, which we know to be indigestible by children, and which are probably more often the first cause of the indigestion.

The President, Dr. J. Lewis Smith, of New York, asked the writer of the paper in regard to the post-mortem appearances in the animals who had died from the effects of tyrotoxicon, and especially in regard to the mucous membrane, which, in patients dying from cholera-infantum, is pallid after an illness of twelve or twenty-four hours, and injected if the disease had lasted three or four days.

Dr. VAUGHAN replied that the mucous membrane of the stomach and intestines had been, as a rule, pale, and even almost white. In cases where the animal had survived a longer time, the membrane had been congested, but never in a very marked degree. The President added that, contrary to the opinion of some good observers, he entertained the conviction that the disease is inflammatory in its nature.

THE NUTRITION OF INFANTS was the subject of a paper before the same section, by Professor Albert R. Leeds, of Stevens' Institute, N. J.

He had undertaken to find a true basis for the preparation of artificial food by analyzing eighty samples of human milk. He found that human milk differs from cows' milk chiefly in the proportion and digestibility of the caseine, which is smaller in quantity and more easily digestible in human than cows' milk. He believed that he had solved the problem by digesting the caseine by a peptogenic powder, easily obtainable and of constant strength, which, with the aid of heat, reduced the caseine in five minutes. Before this cooking, the milk had been first diluted with water in order to lessen the proportion of caseine, and then had been enriched by the addition of

cream to restore the normal proportion of fat. The results of a very large number of trials, followed by careful observation, encouraged the belief that by this process the artificial feeding of infants had nearly reached perfection.

THE MILK SUPPLY OF CITIES was the subject of a paper before the same section by Dr. CYRUS EDSON, of New York. He invited attention to the great importance of improving and maintaining the standard of milk supply by banishing adulterated and infected milk. He advocated the examination by veterinary inspectors, from time to time, of every herd of cattle in the State, in order to secure the destruction of all animals suffering from tuberculosis, and the quarantine of those liable to cause contagious disease.

Professor LEEDS remarked that the work done by inspectors in preventing the dilution of milk is important from a commercial rather than a sanitary point of view, as water is in itself a harmless adulterant. The best work is done when official inspection is extended so as to include the pasture, the stall, and the dairy. Skilled and scientific effort in this direction would prevent the spread of infectious diseases from cattle to man.

VACCINATION DURING THE INCUBATION PERIOD OF VARIOLA was the subject of a paper by Dr. WILLIAM WELCH, of Philadelphia, Pa., read before the Section on Dermatology and Syphilography.

He showed that vaccination during the incubation period of variola has, at least in his own hands, given gratifying results, preventing or modifying the small-pox eruption. The contrary view he believed to be unsupported by facts.

Vaccination during the initial stage is valueless. If it be performed very early in the incubation stage it exerts a modifying influence, and may prevent the attack altogether.

Vaccinia does not begin to exert its effect until the formation of the areola about the vesicles.

It must not be long delayed after the contagion has been received in the system if favorable results are expected. The character of the vesicle has much to do with the protection secured. When the vesicles are imperfectly formed or retarded the efficacy is to be feared. Animal lymph is too un-

reliable. Fresh, eighth-day lymph from a typical vaccine vesicle is to be preferred.

By numerous insertions of the virus we are more sure of good results. He has no doubt the process of vaccinia is hastened by multiple insertions.

He has made observations upon one hundred and forty-four cases, from which he has been led to believe that vaccination in the incubation period gives a certain immunity from variola.

Dr. CUNDELL JULER, of Cincinnati, O., said he believed that the lymph from the vesicle itself gave an immunity which the crust did not, and when used he did not consider revaccination necessary, but with the crust it was. The lancet should be kept scrupulously clean.

Dr. ROGERS PARKER, of Liverpool, England, a public vaccinator for the city of Liverpool, said that in the large cities of England human lymph was usually employed. Large vaccination stations were established, to which the parents were required to bring the children at certain times, and the children vaccinated the previous week returned upon this day, so that there was always an abundance of vesicles from which to choose in vaccinating the others. Revaccination is not compulsory, but was usually done in schools and public bodies at about the age of fourteen.

Dr. GOTTHEIL, of New York, said that he had frequently noticed a fungating sore about two weeks after vaccination, which he had regarded as a weak ulcer. With some sets of lymph it always appeared, and with others never.

Dr. KELLER, of Hot Springs, Ark., related an incident of war times. He was in charge of a hospital on the Southern side. An epidemic of variola broke out. A supply of lymph was received, with instructions that it came from the North, and was suspected of being poisoned. Such stories were then current. He decided to use it, and, to avoid error, divided each point, vaccinating a citizen with one part and a soldier with the other. Nine tenths of the soldiers had unhealthy sores following the operation, but none of the citizens, showing that they were due to the scorbutic condition of the soldiers, and not to impure virus.

Dr. YEAMANS, of Detroit, Mich., said his belief in the protective power of vaccination, after exposure had occurred,

grew yearly less and less. He had had considerable experience in the matter, and thought we lose sight of the many other influences brought to bear which may modify the case under observation.

Dr. LATHROP, of Dover, N. H., believed that he had seen vaccinia take the place of small-pox.

Dr. ROBINSON, the President, asked why, if vaccinia depended on micro-organisms, which multiply so rapidly, more than one point of inoculation was necessary?

Dr. WELCH, in closing, said he had been sceptical in regard to the necessity for multiple inoculations, and believed one typical cicatrix gave as good protection as many.

Animal virus, or virus of recent humanization, gives a more durable protection. That of long humanization produces a more superficial scar, and deaths were more frequent in those showing superficial scars. He does not believe in life-long protection of vaccination. The ulcers mentioned by Dr. Gottheil he thought were only found after animal lymph had been used. It is not true vaccination, and gives no protection.

THE PREVENTIVE POWER OF VACCINATION, by Dr. JOSEF KÖRÖSI, Director of the Communal Statistics of Buda-Pesth, Hungary, in a paper read before the Section on General Medicine, gave a critical review of vaccinal statistics. After gathering all the different modes of argumentation used up to the present time to attack or to defend the protective power of vaccination, he arrived at the result that the statistical base of these proofs is much weaker than is generally supposed by men of science who could not enter into an examination of the value of the different statistical methods. Even when the direct proof could be furnished, and even when we would find in this way that the morbidity or mortality of the non-vaccinated is the greater one, the anti-vaccinators reply that the whole of the non-vaccinated represents a weaker totality, consisting of the poorer elements, the sick and weaker children; and that this totality is naturally more exposed to get any sickness but not in consequence of the lack of vaccination, but of the lack of vital powers—an argument which threatens to subvert all vaccinal statistics.

Dr. Körösi shows us that this difficulty can be settled. If



we knew what is, for instance, the general lethality of the non-vaccinated, we could learn whether their special small-pox lethality is greater ; this difference ought to be attributed exclusively to the lack of vaccination. Dr. Körösi distinguishes between mortality and lethality. Mortality is the chance for each living person to die ; lethality is the chance for those who are already sick to die. The two notions are widely different, but, notwithstanding, often confounded. The mortality of small-pox, for instance, rose to one per cent, the lethality might rise to sixty or seventy per cent. But to ascertain the general lethality of the vaccinated and non-vaccinated people, it would be necessary that the hospitals should state, not only for the small-pox patients, but also for each case of sickness—even the surgical cases not excluded—whether they were vaccinated or not. This innovation was introduced in 1886, at the proposition of Dr. Körösi, in nineteen hospitals of Buda-Pesth and of provincial cities in Hungary. Here the results of the first year's observation, embracing more than twenty thousand cases, showed the general lethality of the vaccinated patients to be eight per cent, and that of the non-vaccinated thirteen per cent.

Thus the assertion of the anti-vaccinationists, that among the non-vaccinated the lethality is probably a greater one, is found to be true. But among the small-pox patients the lethality of the non-vaccinated rose to 6.66 per cent ; the lethality of the non-vaccinated should thus represent about ten per cent, but, in fact, that lethality is not less than 49.68 per cent. No doubt it was wrong to regard the whole of this increase (nearly eight hundred per cent) as the consequence of the non-vaccination. The result is a product of two factors ; at one hand of the weaker constitution of the non-vaccinated, and on the other hand of the lack of vaccination. Knowing now the value of one factor, we can calculate what has to be attributed to the other. So we can state that for the non-vaccinated small-pox patients the chance of dying is raised *exclusively by the lack of vaccination* to five hundred per cent.

The same observation made it possible to state also in what degree the morbidity of the non-vaccinated is raised. The result is that the lack of vaccination causes three and a half times more cases of small-pox.

To apply the new method on the mortality, it would be required that at each case of death—and not, as is usual, only at the deaths caused by small-pox—it should be stated whether the person was vaccinated or not. This new regulation has been introduced at Buda-Pesth since 1886; the coroners have to inquire the fact regarding vaccination in each case of death. As also nine other Hungarian cities agree to introduce this new regulation, the observations of Dr. KÖRÖSI embrace a population of 717,195 persons. The results of the first year show that the chance to die by small-pox is raised by six hundred per cent for each non-vaccinated person exclusively in consequence of the lack of vaccination. This new and fruitful method of investigation has finally been applied also to the very important problems of inoculation of syphilis, erysipelas, tuberculosis, etc. In the ordinary way of vaccination statistics, it is nearly impossible to answer this question. If a man who has been vaccinated in his childhood later gets tuberculosis, how could we know whether his sickness had been caused by vaccination or any other cause? But the new method furnishes the answer. If tuberculosis, syphilis, etc., have been caused by inoculation we ought to find among the vaccinated people more cases than among the non-vaccinated. It is now found that—at least in this first year of observation—there was to be found no influence of vaccination upon syphilis or tuberculosis. But what he found was that for the children the number of the cutaneous diseases is raised by vaccination, but only by thirteen per cent. Making up now the balance of vaccination and counting its benefits on the credit, its damages on the debit side, it is found that among a population like that of the United States the vaccination would save annually 120,000 lives, while the number of children dying from cutaneous diseases, etc., caused by vaccination, might make 300, so that the balance is an extremely favorable one. The vaccination is an operation, but who would prohibit a life-saving operation where the chances of danger are so extremely few as above mentioned?

Dr. KÖRÖSI finished his paper with the remark that after having now furnished direct answers on the protective power of vaccination, we might safely extinguish doubts about the blessings of Jenner's important discovery, which, after the

ingenious generalizations of Pasteur, has lost the character of an inconceivable and quite extraordinary appearance, and which must be regarded as one of the most beneficial results of happy empiricism and science.

Dr. C. A. LEALE, of New York, expressed himself as greatly interested in the paper, especially for the valuable statistics, evidently the result of so much patient labor. He referred to a commission which had been appointed under his supervision to inquire after the health of the sick children in New York, with the result that there was not a case reported which had had small-pox. This he attributes to the good virus and enforcement of vaccination among all classes.

Twenty years ago he was called to investigate two cases of death alleged to be the result of small-pox, but these were evidently due to erysipelas due to a scratch ; this was rendered more positive, as others were vaccinated with the same virus without harm. He once saw, at the College of Physicians and Surgeons, a child where it was certified that the child was suffering from the secondary stages of syphilis due to vaccination.

Dr. W. M. WHITMARSH, of England, inquired what virus was used, humanized or bovine.

Dr. KÖRÖSI said it depended upon the physician.

Dr. JOHN LYNCH, of Baltimore, said that it was only cranks who will contend that vaccination does not prevent and modify small-pox. Animal virus will always be safe, and ought always to be used.

Dr. WILLIAM WAUGH, of Philadelphia, said that statistics ought to be read in the light of personal experience. In a few cases abscesses would occur. He knew of one case of destruction of the eye from the child transferring the matter into it from the arm.

A vote of thanks was extended to Dr. Körösi, and a committee appointed to consider his paper.

Dr. KÖRÖSI said that statistics reported against vaccination were greatly falsified.

VACCINATION AND PASTEUR'S TREATMENT, by Dr. W. M. WHITMARSH, London, England, in a paper read before the same section, considered the subject of vaccination generally,

giving a *résumé* of its history from the time of Jenner. He was not in a position, even from a very large experience, to state that vaccination is a preventive against variola, although many believe it to be so. Vaccination does, however, lessen the liability, even though it may not give a complete immunity from disease. Forty years ago sixty per cent of the people in England were to be seen pitted by small-pox, while at the present day there is hardly one per cent.

In England it is compulsory that all children over three months old shall be vaccinated. Such a law being in vogue, it is the duty of the State to use special care in the selecting of good lymph. This they evidently have not done, the authorities at present depending upon humanized virus, which they dealt out gratuitously to the poor.

That vaccination may transmit disease is conclusively proven in the case of Dr. Cary, who syphilized himself in endeavoring to prove that such a transmission was impossible. Again, there were the instances of the large number of children in Sweden, and the body of soldiers in Algiers, who were similarly infected.

Educate people up to the fact that vaccination, when properly performed, is a good measure, and then their common sense will make them adopt it. During the year ending September, 1885, there were in England 2806 persons prosecuted for refusing to comply with the law and be vaccinated.

As to how many punctures should be made, and the frequency with which the vaccination should be repeated, there is a variety of opinions. It seems probable that seven years is the longest time allowable before revaccinating.

"Pasteur's Treatment" he reviewed very elaborately, and the method and principle involved in the preparation of the virus for inoculation. The various instruments used were presented, and their use explained; also a solution, hermetically sealed, containing the prepared virus. Sterilized beef-tea is the vehicle used to contain the virus.

As to Pasteur, he is undoubtedly a first-class scientific chemist, but doubtless he knows little of the art of surgery or the science of medicine. So far as his operations are directed he is constantly changing his methods, thereby showing that he is somewhat doubtful of his standpoints.



It is proved without doubt that dogs shut up in a room and given but a small quantity of water will go mad. In the cases presented and operated upon in Pasteur's laboratory it is extremely doubtful as to whether the patients have had hydrophobia, and consequently it is difficult to determine the curative efficacy of his inoculations. Pasteur originated a disease in rabbits, which he called rabies. It is important, since some of his cases have been fatal, that the disease be not originated by this process of treatment in a person supposed to be, though not actually, suffering from the disease.

There were cases in which Pasteur's treatment had failed, even in a case in which there had been no delay in coming under the treatment.

The only way to settle the question is by the means employed fifty years ago in reference to small-pox, and that was upon convicts, allowing them their choice between their sentence and becoming the subject of experimentation.

It is also necessary to enforce more stringent laws in reference to dogs. They ought to be registered, muzzled, and more carefully looked after by examining veterinary surgeons.

Great credit is due to Pasteur for his earnest labors, and it is to be hoped that, if he has not already, he may eventually make a new discovery.

Dr. C. A. LEALE, of New York City, expressed his great interest in the papers, and spoke on the latter. As medical officer for several large benevolent institutions for sick children he had coming under his observation from eighteen to twenty thousand sick children annually. These children were sent from all parts of the city, and all were carefully examined by competent medical men. As these children are only the sick ones of the families, they represent the number taken from at least one hundred thousand children in the city and surrounding places. He had never seen, or had reported to him, a single case of hydrophobia, although hundreds of these children had at different times been bitten by dogs. He had had similar experience in dispensary practice.

He is convinced that much harm has been done by unnecessarily exciting those bitten. It is to be sincerely hoped that the profession will not, with our present knowledge, resort to Pasteur's method of inoculation.

Dr. WILLIAM WELCH, of Philadelphia, Pa., said : I believe vaccination possesses the power of absolutely preventing small-pox. To be entirely free from danger it must be recently and properly done, and under such circumstances he had never seen any bad result. In his hospital experience he had had five thousand cases come under his observation, and after vaccination he allowed attendants to wait upon the sick patients without their contracting the disease. Humanized virus is preferable, especially such as has been long humanized through several inoculations. It is well, with long humanized virus, to make several inoculations, as virus thus attenuated does not make so profound an impression.

As to durability, it does run out. It was noticeable that among the cases admitted there were no, or very few, children brought in with the disease who had been vaccinated. One of these died.

The dangers of vaccination are two : syphilis and erysipelas—the latter often caused by carelessness on the part of the physician.

THE DISEASE INEBRIETY AND ITS TREATMENT, was the subject of a paper before the same section, by Dr. T. D. CROTHERS, Superintendent of Walnut Lodge, Hartford, Conn. Particular attention was invited to the historic fact that inebriety was called a disease long before insanity was thought to be other than spiritual madness. On an old papyrus found in one of the tombs of Egypt, dating far back into antiquity, a clear recognition of inebriety was found. Herodotus wrote, four centuries before the Christian era, that drunkenness was both a disease of the body and mind. Other writers were noted who had urged this same idea, for centuries down to the present. By a strange shifting of events, insanity, which was supposed to be a spiritual affection until a comparatively recent date, is now studied as a physical disorder, while inebriety, which was mentioned as a disease twenty centuries ago, is still invested with the superstition of a spiritual origin.

The doctor said when inebriety is seen from a scientific point of view, it is found to be controlled by laws which vary according to certain physiological, psychological, and physical

forces, of which heredity, environment, culture, nutrition, brain and nerve-vigor, are most prominent. When accurately recorded histories of many cases of inebriety are studied and compared, certain fixed ranges of causes appear, which follow some regular order of movement. These causes were summarized as follows :

1. Certain conditions of heredity, certain physical and psychical shocks and nerve-injuries, are followed by inebriety in a large proportion of cases.

2. Certain structural changes of the brain and functional perversions, certain disturbances of nutrition, and nerve-irritation precede inebriety in many cases.

3. Certain unstable brain-organizations, regular, retarded, and defective brain-developments, etc., are apparent causes in many cases.

4. Certain diseases seem to have a special predisposition to develop into inebriety without any exciting causes.

These groups were discussed in detail.

In dipsomania and periodical inebriety a condition allied to epilepsy was mentioned. The explosions of the craze for drink were called nerve-storms ; the regularity and uniformity of these periods were mentioned.

The uniformity of the symptoms of inebriety were described. Inebriety was affirmed to be increasing, and becoming more concealed every year. The coarser features were giving way to mania and suicide, etc.

The evidence of drink-cycles were described, and the temperance movements were affirmed to be reactions of the drink-cycles, and governed by laws and forces unknown.

In the treatment, work-house hospitals, conducted on a military basis, were urged, such hospitals to be built from the license fund and made like quarantine stations, where the patients could be controlled and placed in the best condition for recovery.

Different plans of treatment were mentioned in detail, and the profession urged to take up this subject and solve its problems along the line of accurately observed facts.

Dr. E. CUTTER, of New York, asked if the doctor was acquainted with the Christian faith-cure.

Dr. CROTHERS replied that he had heard of it, but was not acquainted with its working.

Dr. CUTTER said that he had sent one patient there, who had been cured after ordinary methods of treatment had failed.

Dr. O'NEAL, of Gettysburg, thought that we ought to watch carefully to see if there is any restlessness or tendency to go on a spree. They must be kept in a safe place. In treating the habit itself, he uses a pen made out of oak boards, in which the patient is confined and given nothing but good, nourishing food.

Dr. FAIR, of Illinois, thought it the great question of the day. He had tried ordinary remedies, but had found church influences the best. It might be a myth, but it seemed to him that these people are greatly assisted by cultivating an instinct which recognizes a superior being who controls them. He cited the case of a man who went fifteen years without liquor under church influences. This man went away, and was supposed to have been lost ; he was found in an isolated building, where he had wandered in his delirium, and had become too weak to remove himself ; he had now gone ten years without drink.

Dr. GEORGE E. STUBBS, of Philadelphia, was reminded, by the paper, of what Dr. O. W. Holmes once remarked : "That in order to treat some diseases, we needed to go back two hundred years." When we know that we are dealing with children from hereditary drunkards, we should properly advise about the bringing up of these children. He had a profound respect for church influences, and the idea of taking your trust in God was always a good thing. But these children must abstain from alcoholic beverages.

Dr. JOHN A. CUTTER, of New York, cited several instances where he believed people to be thoroughly cured by religious influence and experience.

Dr. WILLIAM WAUGH, of Philadelphia, said : I believe in these remedies, but for other reasons than that claimed. Inebriate asylums cure only to make the patients worse. On account of the fact that he has been kept idle, is supported by kind friends, and having every attention given him, he becomes indolent and careless, desiring only to be pampered. The patients ought to be made to do physical labor. Too much is now attributed to mental influences ; they also need attention given to the physical part of their being.



He had a case where a week before the attack of inebriety there would be an absence of bile in the passages.

Another case was presented to him where there was a red deposit in the urine preceding this attack. Appropriate remedies relieved these cases.

Dr. CRONYN, of Buffalo, N. Y., spoke of the Italian method of treatment, which consists of giving the patient food steeped in wine until he gets a strong dislike to alcoholics. He claimed that this treatment seldom failed.

Dr. CROTHERS replied that these cases are practically insane. There is no one plan of treatment. Inebriety ought to be considered a disease as much as typhoid-fever, and we are as capable of caring for it as any clergyman. He could convert them into the church. They are emotionally diseased, and this conversion is a part of that disease. All these methods, such as faith-cure, moral influences, etc., are good, but such treatment is incomplete.

Dr. OUCHTERLONY said that some of the greatest drunkards he ever knew had been clergymen, on account of which it seemed improbable that moral influences alone were sufficient for a cure.

THE DELETERIOUS EFFECTS OF TOBACCO ON THE THROAT AND NOSE, was the subject of a paper by M. F. COOMES, M.D., of Louisville, Ky., read before the Section on Laryngology. He considered smoking far more injurious to these parts than chewing. The smoke came into the mouth heated, and loaded with an irritating oil that would soon coat the mucous membrane were it not washed away by the saliva. Cigarette-smoking is especially injurious, because the smoke is so universally inhaled, causing pharyngitis laryngitis, and chronic irritation in the nose, not to mention the injury it may occasion to trachea and lungs. Where the smoke is habitually expelled through the nose, we find hypertrophies, congestion, dilated vessels, and a hemorrhagic condition. The shell is impaired or destroyed. The potash salts may also have some effect in adding to the injury. Ninety-five per cent of smokers have something abnormal or unhealthy about the upper air-passages. In bad cases, he found chronic hyperæmia and inflammation of epiglottis, with congested cords, and a hack-

ing cough to remove the tough mucus; the voice tires easily.

A peculiar form of tobacco habit is what is known in the South as dipping snuff. It is prevalent among negroes and among the lower classes. They chew the end of a twig so as to form a rude brush, then they continually dip this into a small box of snuff, and rub it over gums and teeth. The gums pushed down on the teeth are red and inflamed, from tobacco lodged between them and the teeth, and the whole pharynx is inflamed.

Dr. STOCKTON thinks that as a nation we are the greatest chewers, and that chewers suffer most. He does not like potash salts used on throat or nose.

Dr. BROWNE smokes cigarettes, and considers them less harmful than any other form, if we don't inhale the smoke and use a fresh mouth-piece.

The taking of snuff is an especially baneful habit, and likely to cause polypi. Singers should not use tobacco. He excludes potash salts, except, perhaps, the bromide, in treating upper air-passages.

THE DISTRIBUTION AND CARE OF THE INSANE IN THE UNITED STATES, was the subject of the opening address of Dr. JUDSON B. ANDREWS, President of the Section in Psychological Medicine.

After delivering an eloquent eulogy on Dr. John P. Gray, who was the first President of this section, he said :

The amount of insanity bears a close relation to the duration of the social and governmental life of the people. Dividing the country into two great belts of north and south, there is an almost regular proportionate decrease of lunacy as we leave the older settled parts of the country along the Atlantic coast, till we reach the extreme western slope.

The New England States lead with 1 insane person to every 359 inhabitants. This decreases until we reach the newer States and Territories with 1 insane person to every 1263 inhabitants. In the seaboard States of the southern belt we have 1 to every 610 inhabitants, and the extreme Southern States with but 1 to every 935 of the population. This emphasizes the statement that the pioneers of our newer settle-

ments are the more hardy and vigorous citizens, and that the feeble and dependent are left in their former homes to enjoy the comforts of the hospitals and asylums, which are the special growth of civilization.

New York is the first Irish city in the world, and Berlin and Hamburg are the only cities which contain as many Germans as our own metropolis. We have among the negroes in the United States 1 insane person to every 1097 of inhabitants. In the negro race the proportionate increase of insanity is far greater than in any other division of the population. From 1870 to 1880 there was an increase in the census of the colored race of 34.85 per cent, while for the same period there was an increase of 25.8 per cent of the insane. This large multiplication has occurred since emancipation from slavery, and the consequent change in condition and life. The causes are briefly told—enlarged freedom, too often ending in license; excessive use of stimulants; excitement of the emotions, already unduly developed; the unaccustomed strife for means of subsistence, educational strain, and poverty. Among the Chinese and aborigines there has been but a small increase of insanity. There is among them less of the refinements of civilization, less competition and struggle for place, power, or wealth, and, as a consequence, less tendency to mental deterioration.

He next presented a list of State institutions in the United States, number of patients in each, and also the number of medical officers attached to each institution. One hundred and twenty-one asylums were represented, fifteen of these having been built since 1880. In 1880 there were 39,093 patients in these asylums. In 1886 the number had increased to 61,411, an annual increase of 9 per cent. At the present rate of increase, before the end of the decennial period we shall have 75,000 in our asylums.

The diversity in lunacy laws in the various States of the Union were compared with those of the general governmental laws of Great Britain. Special accommodation for the criminal class—a highly desirable innovation—has been entered upon by two States only—New York and Illinois.

With the exception of Delaware and Vermont, every State in the Union has adopted the State system of caring for the

insane, and New York was the first State to erect separate asylums for the chronic insane. Asylum architecture has undergone material changes during the past twenty years, the plan now most generally adopted being that of building detached blocks of structures in different parts of the asylum grounds, within easy reach of the administration building, these to accommodate the feeble and helpless, the epileptics and acutely maniacal patients. In many portions of the country, buildings separate and complete are joined by connecting fire-proof corridors.

He then proceeded to outline some of the important changes occurring in the interior management of asylums at the present time. Among them, the introduction of electricity for lighting purposes, of direct radiation for heating purposes, and of natural ventilation as taking the place of the blower-fans much in vogue in former years.

A higher medical standard is to be noted in the asylums of the United States. The medical officers are in very few cases appointed through political favoritism, and in the State of New York the Civil Service requirements insure the sound medical equipment of assistant physicians. Oöphorectomy is now recognized as a legitimate mode of treatment, and castration in appropriate cases has, at present, some able advocates; electricity is now being used with more intelligent knowledge of its power. Its hand-maid massage, less powerful and less mysterious, but not less practical, has gained a position of prominence in the treatment of insanity in many institutions. The experiments in mesmerism, mind-reading, and the faith-cure have led to a closer investigation into the relation between mind and body, with a result of finding in expectant attention a valuable and legitimate help in the treatment of mental diseases.

THE NECESSITY FOR A MORE CAREFUL EXAMINATION OF THE WATER SUPPLY OF MILITARY POSTS, WHERE AN UNUSUAL AMOUNT OF SICKNESS PREVAILS, AND EXAMINATION OF HYGIENIC SURROUNDINGS, was the subject of a paper read by MORSE K. TAYLOR, M.D., Major and Surgeon United States Army, of San Antonio, Texas, before the Section in Military and Naval Surgery and Medicine.



He briefly reviewed the history of army sanitation in this country, and spoke of the alarming death-rate at some of the military posts, due mainly to enteric and malarial-fevers; an improvement at these military posts could only be had by giving proper attention to the water-supply and general sanitation of such military posts. The author showed that very little attention had been given to these subjects, and that there had resulted a vast amount of sickness in the army. This sickness is remediable, as typhoid and malarial-fevers are preventable; for it is shown that where they exist in excess, it is because of inattention or neglect to seek their cause and apply the proper remedies. Wherever efforts have been made to supply those military posts and camps with an abundant supply of pure water, there has resulted great improvement in the health of the soldiers, and a consequent reduction in the mortality. Many cases were related, re-enforced with copious figures, in proof of the author's assertions.

In the brief discussion which followed, Dr. WILLIAM H. LLOYD, Inspector-General of the British Navy, spoke of the very great importance of an abundant supply of pure water at military posts. He had noticed a certain relation between the rainfall of a region and the prevalence therein of malarial-fevers, and that an increase in the development of these fevers was generally the immediate result of a great fall of rain in the region where these diseases prevail; the speaker was unable to explain the mysterious influence which is here at work. He also, in closing, alluded to the fact that analyses of water for the use of the British Navy are regularly made, and that an improvement in the general health has been directly traceable to the pure water in use therein.

Dr. JOSEPH R. SMITH, United States Army, thought it was not an easy thing to decide as to the innocuity and harmfulness of a given water, for it was a well-known fact that many waters, even when containing a large amount of organic substances, could at times be used with impunity, while at others its use was attended with baneful results. It was impracticable, he said, to make use of the microscope in the field; the eyes, nose, and tongue of a soldier were his best guides, he thought, in the selection of water for drinking purposes, but there were times, while in the field, when the soldier could

not exercise his judgment in such selection, and must drink any water that can be found, irrespective of its color, smell, or taste, and his drinking such water was not to be prevented. As to the water supply of military posts, he thought the surgeon was powerless in preventing the pollution of the water, particularly at posts situated within populous districts ; but that, in such cases, in public sentiment and appropriate legislation of the several States lay the only remedy.

Dr. MARSTON, of England, briefly reviewed certain epidemics which he had observed among soldiers, which were undoubtedly caused by the use of impure water ; the latter was not the only cause assignable, however, in the development of malarial-fevers ; that the influence of freshly disturbed soil was apt to be overlooked. In certain malarial districts of China this influence was so commonly recognized that it is a popular belief, and one which would seem to be warranted by observation, that even so slight a disturbance of the earth as the scratching of the earth by domestic fowls in quest of food is sometimes followed by the occurrence of cases of malarial-fever in the neighborhood.

In conclusion, the doctor called attention to the undoubted influence of water containing the salts of lime in solution in the causation of goitre, and gave an illustration of an epidemic observed by him, when the disease was directly traceable to the use of such water.

Dr. JOSEPH R. SMITH, United States Army, read a paper before the same section on the question of

#### THE BEST RATIONS FOR THE SOLDIER.

The author endeavored to show the difficulties in the way of ascertaining the exact amount of food that will suffice for the soldier in service, and compared the rations of different European armies, and the diets devised by various observers and experimenters. He showed that in general they err on the side of too great abundance, and briefly alluded to the proportion of carbon and nitrogen which the ration of the soldier should contain. He suggested two rations for armies, whose mean proportions of carbon and nitrogen would be about five thousand grains of the former and about three hundred grains of the latter. The paper was illustrated by

numerous tables, showing the composition of the rations designed by Moleschott, Playfair, Pettenkofer, and Parkes.

Dr. JEFFREY A. MARSTON, of England, read a paper before the same section on

AGE AND ACCLIMATIZATION OF SOLDIERS IN REFERENCE TO  
SERVICE.

With regard to age, the author said that a man was best fitted for service, at least in India, between the age of twenty-seven and thirty years. He alluded to the well-known fact that the younger men, although capable of enduring great hardships and privations for a short period, are inferior to adults in their powers of endurance in long-continued efforts.

The influence of climate upon the soldier was discussed at length, the speaker more particularly describing the effects of Indian climate upon the newly-arrived soldier. He presented tables showing the mortality among soldiers in Indian service, stating that the prevailing disease among the soldiers is enteric or typhoid-fever. This disease may be said to have no geography, extending, as it does, from the Rocky Mountains to the Himalayas. It prevails among Europeans, and is also more frequently fatal during the hot and cold seasons; according to the experience of Indian surgeons, the greatest period of susceptibility lies between the age of eighteen and thirty years. The liability of death during his first year of Indian service by this disease is greater than by all other diseases.

The British troops suffered greatly in Egypt during the campaign of 1882; in the Soudan campaign of 1884 the troops suffered less from this cause, being daily supplied with condensed water; but in 1885, in spite of this same precaution, and of great attention to sanitary details, for some reason still unaccounted for, the sickness, from this disease was excessive.

During the first year of the young soldier's sojourn in India he is likely to be attacked by a fatal form of pneumonia. But of the prevailing affections, next to enteric-fever, hepatitis heads the list, this disease being very commonly met with. Cardiac disorders come next in the order of prevalence.

In the discussion which followed, Dr. MORSE K. TAYLOR, United States Army, stated that his experience agreed with that of Dr. Marston in regard to the prevalence of heart affec-

tions among soldiers ; this fact, he thought, was not sufficiently recognized by our own surgeons.

Surgeon-General G. T. LANGRIDGE, of the British Army, fully indorsed the view of Dr. Marston with regard to the greater power of endurance of the adult men over the younger ; these latter, he said, were constantly breaking down when marching, particularly when exposed to the heat. During the Afghan campaign the troops suffered more from enteric-fever than from any other disease.

In the absence of the authors, the next three papers were read by title. The first of these was entitled :

“ Is it desirable that each soldier in time of war should personally carry a first field-dressing for a wound ? If so, is it advisable that a preliminary wound-dressing should form part of the equipment of every soldier on taking the field ? Of what shall it consist, and in what part of the soldier's equipment should it be carried ? ” By Sir THOMAS LONGMORE, of Netley, England, Professor of Military Surgery at the Army Medical School. The paper was accompanied by a dressing devised by the author for this purpose.

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## EDITOR'S TABLE.

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THE SANITARIAN has been unavoidably delayed since the issue of the August number, partly by the time taken up in preparing the full abstract of the papers on Preventive Medicine, read before the International Medical Congress, on preceding pages ; partly by the Editor's efforts with Health Officer Smith in preventing the introduction of Cholera (a full account of which will be given in the November number), and partly for other equally good reasons, all of which are now overcome, and other numbers due will follow in quick succession until the accustomed time of issue is reached—about the fifteenth of each month.

THE SUCCESS OF THE NINTH INTERNATIONAL MEDICAL CONGRESS has been so pronounced as to leave no disappoint-



ments, except to those who opposed and those whom the opposers deceived by predicting its failure. With the latter there is cause for sympathy and regret for their absence—doubtless by themselves no less than by those who missed their presence. But with regard to those who exerted themselves to prevent the success of the Congress, and so signally succeeded in forfeiting the confidence of their friends, their humiliation is a merited retribution.

The number in attendance compares favorably with any previous Congress—indeed, most favorably; for while the number registered at the meeting in London in 1881 was 3182, as against 2800 registered in Washington, it should be borne in mind that at the former 1145 were of resident physicians, whereas in Washington the number of resident physicians who registered was only about 400—a difference considerably greater than that between the totals of the two Congresses. Of the European delegation, the number was relatively smaller for manifest reasons—of time, distance, etc.—though doubtless there would have been a larger number but for the persuasion of the malcontents.

The scientific work presented, in the opinion of many of those present who have been members of previous Congresses, and who are otherwise eminently competent judges, will, when published, compare favorably with that of any previous one.

Our abstract is confined to the papers read in the Section in Public and International Hygiene, and those which ought to and would have been read there but for the unjustifiable manifestation of resentment to the presiding officer because of his attitude toward the National Board of Health several years ago, when he was President of the Louisiana State Board of Health. Notwithstanding, as shown by the abstract on other pages, there was a good deal of creditable work on preventive medicine in the section, which, taken in conjunction with that appertaining to the same general subject in other sections, will fully equal, if it does not, indeed, surpass, that of any previous Congress.

Of the executive work in the detail of the management and entertainments, the fault-finders, so far as we have been able to learn, are chiefly limited to those who have had little or no

practical knowledge in such matters, and who arrogate to themselves an amount of skill untested by experience. That some things might have been better is certainly no reflection upon the general success, due, as was well remarked by the secretary-general, to no one man, but to the concurrent assiduity and self-abnegation of the executive and local committees, determined from the outset to patiently endure all complaints, and abstain from all doubtful proceedings; and, considering the multitude of volunteer prompters and would-be participants in their functions, who urged them by post, waylaid them in their rounds, and elbowed them in their counsels, the exceptions to a perfect success are so infinitesimal as to be visible to those only who have the least appreciation of the character of the work performed.

The satisfaction expressed by Drs. Graily Hewitt and Edmund Owen, of London, Dr. Martin, of Berlin, and Dr. Landolt, of Paris, in behalf of the foreign delegation, and the heartiness with which their remarks were received, and the final address of the President of the Congress, will be cherished by all those who heard them as lasting memorials of the cordiality of the largest assembly of medical men ever assembled hitherto in America. And it is surely not too much to hope that the closing words of Dr. Davis's address, that :

"During many years of professional life, extending over half a century, it has been my duty and pleasure to promote harmony among all branches of the profession, and to foster that free intercourse which always by interchange of ideas increases practice and diffuses knowledge so as to make the great objects of workers for the cause of humanity and the relief of suffering, not only for the country in which they live, but one for the whole world," may find a hearty response among the profession, and in the State of New York especially, to the speedy healing of the discord which there exists; and that, ere the Tenth International Medical Congress meets in Berlin, three years hence, the precedent in the terms of admission adopted by the Ninth may be followed by the American Medical Association, and that no delegate from the State of New York may be subjected to the humiliating inquiry of whether he represents the State Society or the State Association, but that all may stand on the same platform.

PROFESSOR H. H. SMITH, OF PHILADELPHIA.—One of the most pleasant incidents connected with the International Medical Congress was the presentation of a set of complimentary resolutions and an elegant vase of onyx, framed in gold and inlaid with gems. In addition to being president of the section, Dr. Smith was Chairman of the Executive Committee of the Congress. For the purpose of the presentation, Dr. William H. Lloyd, Deputy Inspector-General of Hospitals and Fleets, London, presided. Dr. E. A. Wood, of Pittsburgh, made the presentation. He paid Dr. Smith a graceful compliment for the way he had worked to make the Congress a success, and continued :

“ Dr. Smith, in this gift we mean something more than reward, more than a souvenir, more than individual regard for you. We wish by it to imply that you are the bond by which has been bound together stronger than before the medical profession of two continents ; that you have thrown down the walls that fence in exclusiveness, and have led illustrious teachers of Europe to rub elbows with the rank and file of the profession in this land.”

Dr. Jeffrey A. Marston, Deputy Surgeon-General of the British Army, praised Dr. Smith for his urbanity in little things, and denominated him one of nature's gentlemen.

“ We would,” said he, speaking for the foreign guests, “ be profoundly ungrateful if we did not value all that has been done for us in America, and I could wish nothing better or more pleasurable than to introduce Dr. Smith to my friends and family in England as a specimen of a true American gentleman.”

Dr. Smith in his reply did not forget to say that the other members of the Executive Committee were as worthy as he, and he said :

“ My efforts have been so warmly seconded in London and on the Continent that I recognize the success of the Congress to be largely due to the action taken by British physicians to neutralize the malicious misrepresentations of those who were willing to cast discredit on the country and profession in order to gratify personal pique. I cannot better express my regret at their course—on which I bear no malice, but feel deep sorrow—than by supplying to them the words of the Wizard of the North:

' Breathes there a man with soul so dead,  
Who never to himself hath said,  
This is my own, my native land—'

You know the rest.'

THE MEDICAL REGISTER merits the warmest of congratulations for the support which it gave and the interest which it infused by its daily edition into the proceedings of the Congress, for which it has earned a reputation for successful journalistic enterprise which will surely, as it ought to, find its reward in a richly-deserved future support throughout the medical world.

#### MORTALITY AND MORBILITY STATISTICS AT THE MOST RECENT DATES.

ALABAMA.—*Mobile* Health Department reports for the month of July 80 deaths in a population estimated at 31,295, of which 27 were under five years of age, and representing an annual death-rate of 30.6 per 1000. From zymotic diseases there were 16 deaths, and from consumption, 11.

CALIFORNIA.—The mortality for the month of July, reported by the Secretary of the State Board of Health from 63 localities, containing an estimated population of 564,000, was 759, a percentage for the month of 1.3 per 1000. Consumption, 91; pneumonia, 38; bronchitis, 8; diphtheria and croup, 34; typhoid-fever, 14; cerebro-spinal meningitis, 10. Small-pox continues in San Francisco; cases have also occurred in Irvington, but all are doing well, and from the vigilant care taken in vaccinating all unprotected persons, it is in a fair way of being speedily stamped out.

*San Francisco*, in a population of 280,000, reports the number of deaths for July, 459; from diphtheria and croup, 27; typhoid-fever, 6; consumption, 51; pneumonia, 32; small-pox, 3. Death-rate, 19.3.

CONNECTICUT.—The reports of mortality from 160 towns in the State, and the reports of sanitary correspondents in relation to sickness, show the great prevalence of intestinal disorders, and how intimately they are associated with a high temperature. The report of no mortality in New London



from infantile diarrhœa is almost the only exception, and is so extraordinary as to excite the suspicion of some error in the report. Another noticeable fact is, how much larger the death-rates are in the large towns than in the small ones. The annual death-rate of the towns of 5000 people and upward was 31.2, while of the towns of less population it was only 19.9. The effects of the excessive extreme of heat and humidity upon infantile life is still more marked upon the residents of the large towns, as compared with those of the rural places. In the former there were in July 88.3 deaths from infantile diarrhœa to every 10,000 of the living in the large towns and cities, while in the country and agricultural districts there were only 11.4.

The most severe and fatal epidemic prevailing in July was located in Waterbury—79 deaths from diarrhœal diseases; and, what is quite exceptional, the majority were not infants, only 37 of them being under five years old. No official report except of the mortality was received at the office of the Secretary of the State Board, but it was currently rumored that dysentery was the chief form of disease, and that the excessive pollution of the river in running through the city was a potent factor among the causes. The other causes of death, not diarrhœal, have not been more active than usual in the State.

The annual death-rate throughout the State in June was 14.8. In July it was 27. The excess is almost wholly because of the greatly increased mortality from intestinal affections, and, with the exception of Waterbury, chiefly among infants.

Diphtheria and croup had only 22 victims, as against 26 in June.

Scarlet-fever killed 8, a smaller number than for several previous months.

Measles is still prevalent, and was fatal in 13 instances.

Typhoid-fever caused 12 deaths.

The malarial-fevers have been more destructive. There were 22 deaths attributed to them, as against only 5 in June.

Whooping-cough has also been more fatal, taking 9 young lives.

*New Britain.*—" Report of the Special Committee appointed

by the Common Council of the City of New Britain, February 3d, 1887, on the Pollution of Piper's Brook." Signed, "B. N. Comings, in behalf of the Committee." This is a special plea for the pollution of the said brook. It is remarkable for the omission of the M.D., to which the author is entitled, if we are not mistaken; and, moreover, for the omission of health officer, or ex-health officer, as the case may be, to his signature, inasmuch as he professes to base some of his observations on ten years' service as health officer. These omissions are significant facts which seem to justify B. N. Comings's report; but would not a report by B. N. Comings, M.D., or by any one who had faithfully performed the duties of health officer for ten years, because these qualifications would suggest wholly different conclusions from the same premises. The case is, as stated by the Secretary of the State Board of Health of Connecticut (Report for 1886):

"Piper's Brook is the receptacle of the sewage of New Britain. It is a small stream, with an average width, in ordinary times, of not more than ten or twenty feet, running through the town of Newington. The country is level in that vicinity, and its course through the farming lands of the valley is winding and tortuous. Before the pollution of the brook by the sewage of New Britain it abounded in fish, and was a clear, sparkling stream of good water. By means of the hydraulic ram it was forced into the houses of the farmers for the ordinary domestic uses of the family and for drinking. . . . For several miles below the point where it receives the New Britain sewage it is a turbid, dirty ditch, the water nowhere showing any degree of transparency. The Secretary of the Board made a personal inspection of the locality, and can certify from his own observation to the accuracy of the last statement."

*Mr. Comings* admits, in his report, that "the appearance of the stream is not in its favor, and the odors arising from its chemicals, in a humid state of the atmosphere, are by no means agreeable." The "chemicals," as he describes them on another page, consist of the sewage of about 8000 people, and the factory and surface drainage of the whole region round about. But "the sewage of Piper's Brook is diluted after leaving the sewer by very nearly ten times its own volume"!

This, he affects to believe, is amply sufficient to render it wholesome for all the requirements of the people of Newington; because, he says, "Streams that appear bad are not always dangerous. The turbid waters of the Mississippi are a much safer potable water than the bright, sparkling water from many a well in the cities." After this exceptional expression of wisdom, illustrated by such a remarkable parallel as that of Piper's Brook and the Mississippi River, he hopes that "the prejudice among the Newington people, which is apparently very intense," may be modified by the facts which he has presented—that, in short, they may become reconciled to the conversion of their town into a cesspool by the people of New Britain.

DELAWARE.—*Wilmington* reports 138 deaths during the month of July in an estimated population of 57,000, of which 82 were under five years of age. Death-rate per 1000, 29.05. From diarrhœal diseases there were 41 deaths, and from consumption, 12.

DISTRICT OF COLUMBIA.—Annual Report of the Commissioners of the District, for the year ending June 30th, 1886. A pamphlet of 80 pages addressed to the president, giving the official doings of the commissioners and their subordinates, and expenses, in detail, among the rest, the health service, and an abstract of the vital statistics.

The health officer reports for the year: Death-rate, 17.96 per 1000 for the whites, and 32.35 for the colored population, or 22.80 per 1000 for the total, as against 24.99 for the preceding year.

The inspector of plumbing demonstrates the value to the public health of his department, as a means of developing among all classes of people a higher appreciation of sanitary considerations in their dwellings. Recent examinations have shown that some of the Government buildings are "in a deplorably unsanitary condition," and plans have been submitted for the improvement of their drainage and plumbing. There is great need of stricter supervision and a more rigid application of the laws of sanitation with regard to the qualifications and licensing of plumbers, there being practically no ascertainment of plumbers' qualifications. The commissioners earnestly

urge measures providing for the examination of plumbers by competent authority, and that incompetent persons be prohibited practice. Sewerage extension to the outlying suburbs is urged, and an enabling act is recommended for this, and also to compel owners to connect their houses.

ILLINOIS.—*Chicago* reports for the month of July, 2107 deaths in a population estimated at 750,000, of which 1225 were under five years of age, and representing an annual death-rate of 33.07 per 1000. From zymotic diseases there were 770 deaths, of which 596 were caused by diarrhœal diseases, and from consumption, 112.

*Rock Island* reports for four weeks ending July 30th, 25 deaths in a population estimated at 13,655, of which 14 were under five years of age. Death-rate per 1000, 19.03. From zymotic diseases there were 12 deaths, and from consumption, 1.

IOWA State Board of Health *Bulletin* of August 15th summarizes the vital statistics of 26 cities, home and foreign, for July, and under the head of "Annual Death-Rate" places the death-rates of Davenport, Des Moines, Dubuque, and Keokuk for the 31 days, 1.2, 1.03, 1.13, and 1.14, respectively, instead of the *annual* rates, for comparison with the figures as given of the other cities.

The *Bulletin* expresses dissatisfaction with THE SANITARIAN'S opinion of it on its first appearance, in that it appears to partake more of the character of journalism than is common to the Bulletins of the other State Boards, which are, in the main, confined to the true significance of the title. And we are now informed that "The sole purpose of this publication is to awaken public attention to the importance of sanitation, and to place the State Board in more frequent and intimate communication with local boards." And the attention of local boards of health throughout the State is urged to it, as it "will contain the official orders and decisions of the Iowa State Board of Health, and a compendium of sanitary and hygienic matters current within the State. The object is to give local boards and the public such timely information regarding the public health as may be of interest, and which now only reaches them in the biennial report of the State



Board." This is certainly legitimate, and in the highest degree commendable. State Board orders and decisions follow, and Monthly Meteorology. But the advertisements appended are inconsistent alike with the declared purpose and the legitimate object of the public health service.

KENTUCKY.—The Proceedings, Addresses, and Discussions of a Public Health Conference, held at Louisville, May 24th and 25th, 1887, under the auspices of the State Board of Health. A pamphlet of 136 pages, containing eighteen stated papers on important subjects and discussions thereon, is well calculated to increase public interest in the life-saving value of practical sanitation, and is eminently worthy of the widest possible circulation among the people.

LOUISIANA.—*New Orleans* reports for July 316 deaths in 176,500 white population and 186 deaths in 66,250 colored population, making the respective death-rates 21.48 and 33.69 per 1000, and 24.81 for the whole population of 242,750. The deaths from zymotic diseases numbered 77, and from consumption, 59. There were 211 deaths under five years of age.

MARYLAND.—*The Sanitation of Cities and Towns and Agricultural Utilization of Excretal Matters. Report on improved methods of sewage disposal and water supplies.* By C. W. CHANCELLOR, M.D., Secretary of the State Board of Health of Maryland, etc., 1887.

We took up this report with the recollection that Dr. Chancellor had done good service, as we thought, in a previous report, in showing the fallacy of the claim of Mr. Waring to "universality" in the application of what has been called the "Memphis system" of sewerage, properly regarding Mr. Waring's persistent advocacy of that system as that of an "interested inventor," in advertising his wares; but the conclusion to which we arrive after reading this report of the doctor's is, that he has fallen into somewhat the same error as did Mr. Waring, in considering his own invention as the *ne plus ultra* of sanitary progress, although he modestly takes the appendix for the description and illustration of his invention, with the prefix, "patent applied for."

In the preface to the report, which is in the shape of a letter

to His Excellency Governor Lloyd, of Maryland, we find a reason for the exhaustive consideration of European methods of sewerage solely in that the report is to be considered as the result of a visit to Europe made by authority, to examine and report upon the plans in operation *there* for the disposal and utilization of household sewage ; and so far the report will prove a convenient reference book, well got up, sufficiently well illustrated, and, above all, thoroughly indexed. Perhaps it was not to be expected that we should have much originality in a report which covers ground already so well worked. It is, however, of service in bringing together much matter which otherwise would have to be sought in scattered publications. The first twelve or thirteen chapters of the report, indeed, will be found ably and briefly comprehended in a paper read by Dr. Bell before the Maryland Board of Health, November 28th, 1883, and published in THE SANITARIAN for January, 1884. Dr. Bell's paper, however, includes a description of an American method of sewage disposal which finds favor in some localities ; and while Dr. Chancellor's mission did not include any comparison with American methods, yet he should have been able to see that the same rigid perfection of workmanship and materials which is recognized as absolutely essential to the success of *any* pneumatic process which has yet been proposed, if applied to the " West " system would insure a satisfactory result, and at far less cost either of construction or maintenance.

With reference to the " Marquand " modification of the pneumatic process, which Dr. Chancellor, with a boldness which we admire, calls attention to as, in his opinion, the proper direction for the solution of the sewage question, we can only say that, like many plans on paper, it gives a fair promise, but is of questionable application in this latitude. Simplicity in the working is essential to any system of sewerage in American cities, and by the doctor's own showing, this is still but in the experimental stage in France, where theoretical consistency is more sought after than practical efficiency ; and as a modification of Liernur's pneumatic process, we can only say, as applied to American cities, quoting from Dr. Bell's paper, " It fulfils no condition which cannot be more economically and effectively conducted by other means."

The final chapter of this report relates to the invention of Dr. Chancellor, which, while named the "Separating and Filtering Process," is, as he claims, both applicable to isolated buildings and aggregations of population. Space will not permit an examination in detail of this process, which aims at separating the solids of human sewage from the liquids at the bottom of the soil pipe of each house. The solids withdraw at intervals; the liquids, by an upward filtration under pressure through a layer of coke, then one of wool, pass by overflow into a compartment with a layer of lichen stone or coarse gravel, then a bed of spongy iron or carbide of iron, and lastly a bed of animal charcoal or sand, and, it is claimed, are thus prepared for delivery into the water-courses, *but not for domestic use*. Not to underestimate the practical value of this invention as a sanitary appliance (for the several steps through which the liquid is supposed to pass are theoretically conducive to the end proposed), I refrain from calling attention to processes called automatic, but which really to be effective will require an intelligent supervision such as could not be relied upon in the average household, and by the use of an apparatus somewhat complicated in its parts, and for the uninterrupted working of which nothing but practice under the varied conditions likely to arrive will demonstrate as reliable and useful. The use of this apparatus, it is claimed, will do away with the necessity of a trap between the house pipe and sewer, as also for carrying the soil pipe above the roof. The advantages of the system are given by the inventor in detail, to which is added the element of comparative cost; but as the latter includes on the credit side the value of the sludge (which, it is claimed, by this process "loses none of its organic properties, but may be easily converted into a *valuable fertilizing agent*"), we are thus left pretty much in the same uncertainty as before this invention, and with the sludge on our hands, of uncertain value in competition with known fertilizers. I cannot see that any real progress is assured by the discoveries embraced in this report. J. W. ADAMS.

*What is the Danger to Health by the Pollution of the Air, Water, and Soil?*—By a recent resolution of the State Board of Health, the Secretary has been requested to determine,

with as much accuracy as possible, to what extent the public health of this State is endangered by the pollution of air, water, and soil, from the escape into them of whatever comes under the head of sewage, including under this term excrement, both solid and liquid, as well as the wet waste from dwellings, manufactories, etc. In order to obtain the necessary information, a series of questions had been prepared, well calculated to elicit the needful information, and sent to all the physicians of the State.

In all cases due credit for information received will be given in the Seventh Biennial Report of the State Board of Health, which is now being prepared.

*Baltimore* reports for five weeks ending July 30th, 1207 deaths in a population estimated at 417,220, of which 710 were under five years of age. Death-rate per 1000, 30.09. From zymotic diseases there were 470 deaths, of which 386 were from diarrhœal diseases; and from consumption, 103.

MASSACHUSETTS.—*Boston* reports for the month of June 654 deaths in a population estimated at 400,000, of which 210 were under five years of age, representing an annual death-rate of 19.6 per 1000. From zymotic diseases there were 99 deaths, and from consumption, 125. For the month of July 1119 deaths, of which 567 were under five years of age; representing an annual death-rate of 33.57 per 1000. From zymotic diseases there were 394 deaths (diarrhœal diseases, 276), and from consumption, 126.

MICHIGAN.—For the month of July, 1887, compared with the preceding month, the reports indicate that diarrhœa, cholera morbus, cholera infantum, and dysentery increased, and that rheumatism, influenza, neuralgia, bronchitis, pneumonia, and tonsillitis decreased in prevalence.

Compared with the preceding month, the temperature in the month of July, 1887, was higher, the absolute humidity was more, the relative humidity was less, the day ozone was about the same, and the night ozone was less.

Compared with the average for the month of July in the nine years, 1879-1887, cholera morbus, cholera infantum, and diarrhœa were more prevalent, and intermittent-fever, con-



sumption of lungs, remittent-fever, scarlet-fever, and diphtheria were less prevalent in July, 1887.

For the month of July, 1887, compared with the average of corresponding months for the nine years, 1879-1887, the temperature was slightly higher, the absolute and the relative humidity were more, and the day and the night ozone were less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of July, 1887, at thirty-six places, scarlet-fever at twenty-five places, measles at twenty-seven places, typhoid-fever at sixteen places, typhus-fever at one place.

Reports from all sources show diphtheria reported at three places less, scarlet-fever at twenty-four places less, typhoid-fever at four places more, measles at nine places less, small-pox at one place less, and typhus-fever at the same number of places in the month of July, 1887, as in the preceding month.

*Detroit* reports for the month of July 559 deaths in a population estimated at 185,000, of which 194 were under five years of age, and representing an annual death-rate of 35.57 per 1000. From zymotic diseases there were 261 deaths (diarrhœal diseases, 210), and from consumption, 36.

MINNESOTA.—*Bulletin* reports for the months of June and July: Diphtheria, 79 cases, with 27 deaths; scarlatina, 31 cases, with 3 deaths.

During the first six months of 1887 there have been returned to the secretary 4523 deaths and 9252 births. Of births by months: January, 1202; February, 1198; March, 1703; April, 1912; May, 1843; June, 1394. Of deaths: January, 525; February, 549; March, 719; April, 959; May, 856; June, 915.

*Diseases of Animals*.—Cases of glanders remaining unaccounted for during the two months, 49; reported, 44; killed, 35; released, 13. Remaining August 1st isolated or not accounted for, 26.

*St. Paul*.—Deaths reported for the month of July, 294 in a population estimated at 150,000; 203 were under five years of age. From zymotic diseases there were 139 deaths (diarrhœal diseases, 89), and from consumption, 16. Annual death-rate of 23.52 per 1000.

MISSOURI.—*St. Louis* reports for the month of July 962 deaths in a population estimated at 420,000, of which 469 were under five years of age, representing an annual death-rate of 27.5 per 1000. From zymotic diseases there were 264 deaths (diarrhœal diseases, 99), and from consumption, 65.

NEW YORK.—*The State Board of Health Bulletin* reports the total mortality of 124 cities and towns, comprising about 3,500,000 inhabitants, for the month of July, 11,463, of which 52.7 per cent were of persons under the age of five years. Of 123 localities, the average annual death-rate per 1000 is 21.76. From zymotic diseases there were 4468 deaths, being 389.68 per 1000 total mortality ; of these 320 per 1000, or nearly one third, were from diarrhœal diseases ; 8.88 per 1000 from typhoid-fever ; from diphtheria, 32.68 per 1000. Deaths from small-pox, 12. From consumption the number of deaths was 956 ; ratio of mortality to total, 83.48 per 1000, and 176.58 per 1000 above the age of five years. The combined death ratio per 1000 from zymotic diseases, consumption, and puerperal diseases is 481.00.

*New York City*, 1,481,920 : Deaths for the month, 4593 ; under five years, 2629 ; of zymotic diseases per 1000 from all causes, 417.40 : diarrhœal diseases, 1554 ; croup and diphtheria, 181 ; typhoid-fever, 33 ; measles, 29 ; malarial diseases, 32 ; whooping-cough, 25 ; small-pox, 7 ; consumption, 390 ; acute respiratory diseases, 208. Death-rate, 37. Percentage of deaths under five years to total deaths, 57.

The following resolutions have recently been adopted and the changes effected, with a view to such pioneer work as we took occasion to remark upon on the appointment of Dr. Bryant as a member of the board :

“ *Resolved*, That on and after October 1st, 1887, the consideration of all diseased animals coming under the jurisdiction of this Department be and is hereby referred to the Division of Contagious Diseases of this Department.

“ *Resolved*, That on and after October 1st, 1887, Dr. Cyrus Edson be and is hereby transferred from the position of Chief Inspector of Food and Chemical Analysis to that of Chief Inspector of Contagious Diseases, and that his salary be increased to \$3000 per annum.

" *Resolved*, That on and after October 1st, 1887, the position of Chief Inspector of Food and Chemical Analysis in this Department be abolished, and that Mr. E. M. Martin, the chemist of the board, be given charge of the duties of that office, and that his salary be increased to \$2000 per annum.

" *Resolved*, That on and after October 1st, 1887, Mr. E. M. Martin be and is hereby directed to report to this board a plan of action which shall contemplate a careful scrutiny of all food and drink commodities of this city, for the purposes of detecting the existence of diseased or adulterated conditions of them."

We are gratified to learn that among the first subjects to engage the attention of the new Contagious Diseases Bureau is the domiciliary relations of pneumonia. Surely nothing could be more suggestive of the foulness of the winter atmosphere of most of the dwelling-houses of New York, and particularly of those which have been constructed upon recently filled-in ground, than the abominably offensive odors of the freshly turned-up soil by the subway commission. In the winter time especially, when the surface of the ground is frozen and the indoor air is rarefied by warming, houses without air-proof cellar, walls, and floors are constant suction-chambers of the foul-soil air. That pneumonia is particularly prevalent and fatal among children and feeble adults, who are for the most part confined to their houses during the coldest weather, and therefore the most exposed to foul-soil air emanations, is no more remarkable than that diphtheria is also most prevalent and fatal under the same conditions, and, moreover, subject to the same means of prevention.

*Brooklyn*, 757,755 : Deaths, 2197 ; under five years, 1298 ; of zymotic diseases per 1000 from all causes, 403.18 : from diarrhoeal diseases, 751 ; croup and diphtheria, 95 ; typhoid-fever, 7 ; malarial diseases, 7 ; whooping-cough, 1 ; scarlet-fever, 13 ; measles, 8 ; consumption, 182 ; acute respiratory diseases, 102. Death-rate, 34.14. Percentage of deaths under five years to total deaths, 59.

*Buffalo*, 202,818 : Deaths for five weeks ending July 30th, 714 ; under five years of age, 466 ; from zymotic diseases per 1000 from all causes, 482.85 ; croup and diphtheria, 8 ; consumption, 44 ; acute respiratory diseases, 23. Death-rate,

36.66. Percentage of deaths under five years to total deaths, 65.2.

*Rochester*, 110,000, month of July : Deaths, 293 ; under five years, 175 ; of zymotic diseases per 1000 from all causes, 423.35 : from diarrhœal diseases, 122 ; croup and diphtheria, 2 ; consumption, 15 ; acute respiratory diseases, 14. Death-rate, 32.18. Percentage of deaths under five years to total deaths, 58.3.

Cities of 10,000 inhabitants and upward in the State of New York having the *lowest* death-rates for the month of July were : Gloversville, 10,000, 8.40 ; Ithaca, 10,000, 13.20 ; Lockport, 15,000, 13.33 ; Ogdensburg, 11,000, 14.20 ; Queensbury, 12,000, 17. Five having the *highest* death-rates for the same month : Newtown, 10,000, 90 per 1000 ; Schenectady, 15,000, 42.40 ; Edgewater, 10,000, 42 ; Jamaica, 10,089, 38.28 ; New York, 1,481,920, 37.

NORTH CAROLINA.—Monthly *Bulletin* for the month of July reports from 43 counties, in 20 of which, as against 14 for the preceding month, there has been more or less of typhoid-fever ; malarial-fever is also more prevalent, in 13 counties an increase of 4 ; diarrhœal diseases in 10 counties only one third as prevalent as during the preceding month. Measles and whooping-cough have also decreased, of the former in 2 counties only, and the latter in 5. Diphtheria, "a few cases" in 3 ; scarlet-fever in 2, and mumps in 1, showing, except typhoid and malarial-fevers, a general improvement. Chicken-cholera and hog-cholera have also well-nigh ceased, the former reported in but 2 counties, and the latter in 1.

*Wilmington* : population—whites, 9900 ; colored, 13,500—23,400. Death-rates : white, 18.2 ; colored, 23.1 : 21.

*Charlotte* : population—white, 6000 ; colored, 5000—11,000. Death-rates : white, 16.0 ; colored, 24 : 19.6.

*Asheville* : population—white, 4641 ; colored, 2607—7248. Death-rates : white, 28.4 ; colored, 18.4 : 24.8.

*Durham* : population—white, 3000 ; colored, 2500—5500. Death-rates : white, 10.7 ; colored, 14.4 : 12. Doubtful returns.

*Fayetteville* : population—white, 2500 ; colored, 1800—4300. Death-rates : white, 4.8 ; colored, 20.0 : 11.2.



*Raleigh* : population—white, 8000 ; colored, 7000—15,000. Death-rates : white, 27 ; colored, 29.1 : 28.

OHIO.—First Annual Report of the State Board for the year ending October 31st, 1886. This report of two hundred and fifty-five pages is virtually for only five months. The board held its first meeting April 30th, but owing to delay in obtaining a secretary, it was not fully organized for practical work until about three months later. Since that time it has been, to say the least, busy in extending its lines, and for the time has accomplished a good deal of excellent work : investigated and aided in stamping out several local epidemics ; exposed water pollutions, bad drainage, food adulterations, the unsanitary condition of school-houses, and numerous nuisances ; and has, besides, produced, elicited, and distributed several valuable papers and numerous circulars instructive to the people and promotive of the public health. Proceedings of the State Sanitary Convention held at Warren, March 30th, 31st, 1887, under the auspices of the board are appended ; which, taken in conjunction with the work of the State Sanitary Association, serves to show that, with a continuation of the work so auspiciously begun by the board, Ohio will ere-long rank among the foremost of the States in the progress of preventive medicine.

*Cincinnati* reports for the month of July 906 deaths in a population estimated at 325,000, of which 458 were under five years of age, and representing an annual death-rate of 33.45 per 1000. From zymotic diseases there were 314 deaths, diarrhœal diseases, 181, and from consumption, 59.

*Cleveland* reports 267 deaths during the month of July in a population of 210,000, of which 483 were of children under five years of age. Two hundred and twenty-four were caused by zymotic diseases ; diarrhœal diseases, 184 ; measles, 6 ; diphtheria and croup, 9 ; and from consumption, 26. Death-rate per 1000 of population, 27.51.

*Toledo* reports for the month of July 145 deaths in a population estimated at 76,000, of which 85 were under five years of age, and representing an annual death-rate of 22.89 per 1000. From zymotic diseases there were 63 deaths, of which 54 were from diarrhœal diseases, and from consumption, 6.

PENNSYLVANIA.—*Philadelphia* reports for three weeks ending July 16th, 1483 deaths in a population estimated at 993,801, of which 796 were under five years of age. Death-rate per 1000, 26.65. From zymotic diseases, there were 395 deaths (300 from diarrhœal diseases), and from consumption, 154.

*Pittsburgh* reports for five weeks ending July 30th, 712 deaths in a population estimated at 200,000, of which 392 were under five years of age. Death-rate, 36.8. From zymotic diseases, there were 73 deaths, and from consumption, 35. Report for *seven years* :

1880 : deaths, 3410 ; from zymotic diseases, 972—28.5 per cent. Death-rate, 21.8.

TENNESSEE *Bulletin* reports : “ The principal diseases named in the order of their greater prevalence in the State for the month of July were malarial-fever, typhoid-fever, cholera infantum, dysentery, diarrhœa, consumption, cholera morbus, pneumonia, and rheumatism.”

Measles in 11 counties ; whooping-cough in 10 ; diphtheria in 3, and scarlet-fever, mumps, roseola, and cerebro-spinal meningitis in one each ; and in Hardin County, *influenza* is almost epidemic.

In the chief cities the respective death-rates for the month, per 1000 of population, annually, are reported as follows :

Chattanooga, white,	22.80 ;	colored,	58.80 : 34.80
Clarksville,	“ 14.40 ;	“	52.00 : 28.50
Columbia,	“ 20.07 ;	“	38.72 : 28.24
Knoxville,	“ 20.02 ;	“	40.95 : 24.71
Memphis,	“ 20.89 ;	“	46.09 : 29.83
Nashville,	“ 16.06 ;	“	39.47 : 22.65

The mean temperature was 78° 8, considerably above the normal, and the highest mean for many years. The maximum temperature was 101° recorded on three different days ; the minimum was 56° recorded on the 1st, and was the highest July minimum since 1883. The hot wave which came about the 10th culminated generally about the 17th–19th, but continued with a slight relaxation until the close of the month, and was the longest warm spell ever known. The ranges of temperature were about the normal.

The precipitation was rather below the average, the mean being 3.32 inches ; of this amount, the Eastern division received an average of about four inches, and the other two divisions about three inches.

TEXAS.—We are gratified to observe by the *Houston Evening News*, of September 17th, that the allegations of the *Daily States*, of New Orleans (three days before), that Dr. Rutherford, Health Officer of Texas, had authorized one C. M. Lane to seek information of the practical work of the Health Department of Louisiana by dishonorable means are officially contradicted. According to the *News*, "Dr. Rutherford sent an agent to New Orleans on business of the Texas State Health Department, as, he claims, he had a right, and as he felt it his duty to do ; but when it came to his knowledge that the same agent at San Antonio was guilty of misconduct, Dr. Rutherford immediately dismissed him from employment in the State Health Department, and that fact the *States* knows very well, for it refers to it in its vindictive and abusive editorial."

The nature of the business required by the Texas Health Department is not referred to ; but the whole ground of offending appears to have been the neglect of the said agent to report the object of his visit to Dr. Holt, the chief of the health service of New Orleans. And this neglect of the agent is alleged by the *States* to have been in accordance with instructions from Dr. Rutherford—an allegation which does not appear to be justified by the promptitude with which he was dismissed from service by Dr. Rutherford, on being made aware of his neglect and subsequent misconduct.

THE SANITARIAN took occasion some time ago to compliment Dr. Rutherford on his reappointment to the office he holds, basing its good opinion of him upon former excellent service, wholly inconsistent with the insinuations of the *States* with regard to his responsibility for the conduct of the agent here referred to. But his previous record as a progressive sanitarian is inconsistent with his effort to change Dr. Holt's regulations with regard to the necessary time for the exercise of aggressive measure of practical sanitation for the protection of the public health, with the least possible obstruction of

commerce, instead of protracted detentions; and his attempted justification of this effort by numerous citations of writers at a distance—from yellow-fever and with no practical acquaintance with it—is not creditable to his own opportunities for observation.

VIRGINIA.—*Richmond* reports for the month of July 262 deaths, in a population estimated at 100,000, of which 133 were under five years of age, representing an annual death-rate of 31.44 per 1000. From zymotic diseases there were 72 deaths, and from consumption, 12.

WISCONSIN.—*Milwaukee* reports for the month of July 479 deaths, in a population estimated at 180,000, of which 201 were under five years of age, representing an annual death-rate of 31.9 per 1000. From zymotic diseases there were 199 deaths, diarrhœal diseases, 165) and from consumption, 20.

YELLOW-FEVER.—*Key West*: As summed up from Surgeon-General Hamilton's report to September 14th, the total number of cases since the outbreak has been 282, with 62 deaths—increase since August 11th, 49 cases, 16 deaths. At *Egmont Key*, the refuge station, there have been 2 additional cases, recovered.

*Havana*: During the five weeks ending September 3d, 79 deaths; there was no abatement—15 deaths during the last week.

*Merida*: During the two weeks ending August 9th, 4 deaths.

*Rio Janeiro*: During the two weeks ending August 6th, 2 deaths.

SMALL-POX.—Summed up from Surgeon-General Hamilton's weekly abstract of sanitary reports and other sources: Deaths from small-pox reported in foreign cities since July 30th to August 27th, latest dates received, except from Havana, to September 3d, as follows: Havana, 211; Guayaquil, 7; Sheffield, 12; Paris, 43; Marseilles, 4; Havre, 8; Nice, 5; Rome, 7; Genoa, 2; Amsterdam, 1; Pesthe, 5; Prague, 5; Trieste, 15; Presburg, 2; Cairo, 2; Vienna, 1; Craco, 2; St. Petersburg, 11; Warsaw, 58; Lisbon, 17; Turin, 1; Bombay, 12; Buenos Ayres, during the month of May, 187; Rio Janeiro, from July 9th to August 6th, 535.



From Surgeon-General Hamilton's Abstract and other sources :

**CHOLERA.**—*Lima* : The United States Consul, in his despatch under date of August 13th, states that " it appears that cholera has never fully disappeared from the south of Chili in reality, and that it is now increasing in a degree at Concepcion, and possibly at Talcahuano and Talca, that is causing much alarm on the coast south."

*Naples* : United States Consul, under date of August 10th, reports that though no official bulletins have been published, there had been up to that date in Naples, 35 cases, with 25 deaths, and that in *Resina*, a short distance from Naples, there were from 5 to 7 cases daily. Under date of August 22d : " Since the 13th instant the number of cases of cholera and deaths ensuing therefrom which occurred in this island have been officially reported to be 70 cases and 19 deaths. Twenty-six deaths occurred during the same period from cases previously reported. . . . The epidemic, which some doubt whether it is the real Asiatic cholera, has not assumed alarming proportions, considering the dense population of this island and the intense heat prevailing this summer."

*Palermo* : The United States Consul reports, August 1st, 1887 : During the week just closed, 12 cases, with 6 deaths, have been reported in the journals ; but it is well known that many more cases and deaths have occurred. August 15th : The cholera appreciably increased during the week ended 14th instant, 70 cases, with 42 deaths.

*Rome* : The Vice-Consul General telegraphed August 25th, 1887, as follows :

" Have been 5 deaths from cholera at Rome since 16th instant."

Cablegram, September 18th : In *Catania* to-day there were 7 new cases of cholera and 4 deaths ; in *Palermo*, 8 new cases and 5 deaths, and in *Messina*, 107 new cases and 47 deaths. No new cases of cholera or deaths from the disease were reported in *Rome* during the twenty-four hours ending with yesterday. In *Naples* and on the Island of *Sicily* the reports show that the disease is decreasing. In *Malta* since the 15th instant there have been 36 new cases of cholera and 18 deaths from the disease.

*Calcutta* : During the quarter ending June 30th, of 2463 deaths, 438 were caused by cholera. July 4th to 26th, 28 deaths from the same cause.

*Bombay* : July 4th to August 2d, deaths from cholera, 51.

*Measles* has been especially prevalent and fatal during the last month in London, Manchester, Dublin, Paris, Marseilles, Bordeaux, Besançon, Genoa, Saragossa, and Munich.

*Diphtheria* prevails in Marseilles, Paris, Berlin, Hamburg, and Catania.

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## LITERARY NOTICES.

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THE HEALTH OF NATIONS : A REVIEW OF THE WORKS OF EDWIN CHADWICK, WITH PORTRAIT AND BIOGRAPHICAL DISSERTATION. By BENJAMIN WARD RICHARDSON. Two volumes, pp. 441 and 444. London : Longmans, Green & Co.

It is doubtful whether the beginning and progress of modern sanitation could be more completely reviewed in any other way than in this account of the works of Edwin Chadwick. While the readers of THE SANITARIAN are far from being ignorant of Mr. Chadwick's works, because almost from its beginning he has been a constant contributor, and, moreover, kindly furnished the data for a sketch of his life, with portrait, in Vol. V., the two handsome volumes before us are, notwithstanding, a mine of wealth to every votary of practical sanitation. Edwin Chadwick began his life-work as a social reformer and public benefactor. Among his first literary efforts was a paper in the *Westminster Review*, in 1828, on "Life Assurance." This was quickly followed by a paper on "Preventive Police," and another on "Public Charities in France," in the *London Review*. These papers attracted the attention of the renowned Jeremy Bentham, to whom Mr. Chadwick shortly afterward, in 1829 (in the twenty-ninth year of his age), became chief assistant and companion in the culmination of his career, and resided with him at the time of his death, in 1832, having two years before become Barrister-at-Law of the Inner Temple. Thus schooled in the philosophy and political economy of Bentham, fortified with legal knowledge, a tireless

capacity for work, and a clear comprehension of the public weal, the first Government Commission appointed to carry out an inquiry into the Poor-Law System of England, in 1833, recognized in him the needful qualities for the prosecution of the work of the commission, and requested that he should be made one of the assistant commissioners intrusted with the duty of visiting different parts of the kingdom, and to institute local inquiries. But scarcely had he entered upon this service before he perceived the imperfection of the plans. This he stated with such clearness and in conjunction with important facts necessary to be observed, that the chief commissioners at once requested that he should be added to their number, a request which was promptly granted. Erelong he was made Secretary of the first Poor-Law Board, which enlarged his executive power, and, with a ready grasp of the most important social problems of the time, he so promptly availed himself of his opportunity that he speedily became the recognized leader in all social reforms.

In 1838 a sudden and severe epidemic broke out in the East End of London in the vicinity of a stagnant pond. The parochial authorities in their distress called upon the resolute and active Secretary of the Poor-Law Board to aid them in their distress. He promptly persuaded his board to institute a medical Commission of Inquiry ; and, the choice of the commission being in his own hands, he chose Drs. Neil Arnot, Kay (afterward Sir Kay Shuttleworth), and Southwood Smith. *This was the first Sanitary Commission.*

His next important step toward a systematic sanitary service was (in the same year) the procurement of a law requiring *Registration of the Causes of Death*, which he had projected in his paper on life insurance ten years before. The duties of this office, on the suggestion of Mr. Chadwick, devolved upon the distinguished Dr. William Farr.

The reports of the Sanitary Commission created such a sensation as to make it comparatively easy to institute other commissions of inquiry into the waste of life from a great variety of removable causes.

The Poor-Law Board being dissolved in September, 1847, Mr. Chadwick and five other well-chosen men were appointed a commission to inquire into the sanitary condition of the

metropolis. The outcome of the reports of this commission was the formation of the first Board of Health of London, in 1848, with Lord Carlisle, Lord Shaftesbury, Mr. Chadwick, and Dr. Southwood Smith as the commissioners.

In 1854 the Board of Health was merged into the Local Government Board, and Mr. Chadwick's official life ended.

We have thus glanced over the relation of Mr. Chadwick to the most important social event of modern times—the initiation of sanitary reform in England—as an indication of the substance of his preliminary and official inquiries and reports, and the subsequent elaboration and practical application of his thoughts in the promotion of the health of nations. The work consists of the gist of Mr. Chadwick's numerous inquiries, directions, public addresses, and essays relating to political economy and the prevention of disease. It is a comprehensive and eminently practical work, insomuch that it is difficult to think of any subject related to the economy of human life or sanitary administration upon which practical deductions cannot be made from these volumes.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. AUTHORS AND SUBJECTS. Vol. VIII. Legier-Medicine (Naval). 4to, pp. 1078. This volume, like those of the same work which have preceded, under the direction of John S. Billings, Surgeon United States Army, maintains the continued elaboration of titles with a view to the utmost facility of reference to and usefulness of one of the most magnificent medical libraries in the world.

“This volume includes 13,405 author-titles, representing 5307 volumes, and 13,205 pamphlets. It also includes 12,642 subject-titles of separate books and pamphlets, and 24,174 titles of articles in periodicals.”

A HANDBOOK OF GENERAL AND OPERATIVE GYNECOLOGY. TWO VOLUMES. VOLUME I., by Dr. A. HAGAR (University of Freiburg); VOLUME II., by Dr. R. KATTENBACH (University of Giessen). Edited by EGBERT H. GRANDIN, M.D., Obstetric Surgeon to the New York Maternity Hospital, Fellow of the Obstetrical Society, etc.



DISEASES OF THE FEMALE MAMMARY GLANDS, by TH. BILLROTH, M.D., of Vienna, and NEW GROWTHS OF THE UTERUS, by A. GUSSEOW, M.D., of Berlin. Illustrated.

DISEASES OF THE FEMALE URETHRA AND BLADDER, by F. WINCKEL, M.D., of the Royal University, Munich; and DISEASES OF THE VAGINA, by A. BREISKY, M.D., of the Royal University, Vienna. Edited by EGBERT H. GRANDIN, M.D., of New York.

These volumes constitute Volumes VI., VII., IX., and X. of "A Cyclopædia of Obstetrics and Gynecology" (12 vols., price, \$16.50), issued monthly during 1887. New York: William Wood & Co. They are uniform with the volumes of the same series before noticed, profusely illustrated, and eminently fulfil the conditions of ready reference books to the best practice on the subjects of which they treat.

INSANITY: ITS CLASSIFICATION, DIAGNOSIS, AND TREATMENT. A MANUAL FOR STUDENTS AND PRACTITIONERS OF MEDICINE. By E. C. SPITZKA, M.D., President of the New York Neurological Society; formerly Physician to the Department of Nervous Diseases of the Metropolitan Throat Hospital; Consulting Neurologist of the North-Eastern Dispensary; Neurologist to the German Polyklinik; W. and S. Tuke Prize Essayist, etc. 12mo, pp. 423. Price, \$2.75. New York: E. B. Treat.

The author of this book is so favorably known to the medical profession by his almost exclusive attention to nervous diseases for many years, his large field of study, and his terseness of style in the presentation of his views, it seems almost unnecessary to say that every physician and student will find it to comprehend almost everything of practical importance on the subject of which it treats, divested of all redundancy. With the author's own extended observation is a thorough incorporation of the views of other and the best authorities. Unfortunately, all physicians are more or less likely to be called upon to detect insanity in that stage when its prompt treatment is most hopeful for the patient, and when, if not recognized, it is most likely to bring discredit upon the medical attendant. The requisite knowledge to meet these conditions is essential to every ambitious medical

student and to every medical practitioner, and no book with which we are acquainted so clearly and concisely presents it as this.

A PRACTICAL TREATISE ON THE DISEASES OF THE HAIR AND SCALP. By GEORGE THOMAS JACKSON, M.D., Instructor in Dermatology in the New York Polyclinic ; Assistant Visiting Physician to the New York Skin and Cancer Hospital ; Member of the New York Dermatological Society, etc. Pp. 356. Illustrated. Price, \$2.75. New York : E. B. Treat.

This work is intended to fulfil an acknowledged want : " A concise statement of what is known of the diseases of the hair and scalp ; special attention being given to their diagnosis and treatment, for the use of the medical practitioner." It is based upon excellent opportunities for practical observation, and, besides, makes free use of recent advances in the knowledge of the subjects of which it treats, by the best authorities ; it is the best work of its kind hitherto published.

THE SYMPATHETIC NERVE. Every medical student and medical practitioner who would ornament his office walls with the most useful of pictures should obtain a copy of J. B. Léveillé's admirable drawing of the sympathetic nerve, drawn and colored from nature, representing adult size, together with the description of the same by Ludovic Hirschfeld, Senior Professor of Anatomy and Surgery to the Medical Faculty, Paris ; Senior Chief of the Clinic, Hotel Dieu, etc. New York : Fowler & Wells Co.

STATISTICS OF LABOR OF THE STATE OF NEW YORK. FOURTH ANNUAL REPORT, FOR THE YEAR 1886. The fulness and usefulness of this report are considerably greater than in either one of the two preceding reports from the same bureau, for the twofold reason that the amendment of the act to provide for the establishment of the bureau, passed by the Legislature, April 22d, 1886, empowering the commissioner " to send for persons and papers, to examine witnesses under oath, to take depositions," etc., was in itself a restraining influence over irregularities and abuses which could no longer be concealed, while it enabled him to obtain evidence from the most

reliable sources not otherwise obtainable. It is gratifying to observe that the results abundantly justify the wisdom of the act, and that but for it the numerous "strikes" and other labor troubles of the year would have been much more embarrassing to both the employers and the employés. The report opens with abstracts of the laws governing the bureau, and next follows the general detail of the work performed, beginning with the investigation of apprenticeship as applied to boy and girl labor. Parts Second to Sixth severally—Manual Training, Technical Institutions and Trade Schools, Strikes, Boycotting and Street-Car Employés—follow, each one comprehending a thoroughness of investigation and particularity of detail in the highest degree practical in its details for the promotion of the public weal by regulations harmonizing and reconciling the differential relations and mutual dependences of all industrial occupations and pursuits.

PROCEEDINGS OF THE FIFTH ANNUAL SESSION OF THE NATIONAL CONVENTION OF CHIEFS AND COMMISSIONERS OF THE VARIOUS BUREAUS OF STATISTICS OF LABOR IN THE UNITED STATES, Madison, Wis., June 8th-10th, 1887, is a pamphlet of 68 pages, containing interesting addresses on "Labor-Bureau Organizations," "Evolutionary Processes in Industrial Reform," "Equal Division of Profits," "Emigration and Labor," "True Nature of Profit," "Statistics as a Basis of Legislation," "Manual Labor in History," and "What Wage-Earners are Promoted." E. R. Hutchins, Commissioner of Iowa, Secretary.

THE LOMB PRIZE ESSAYS: A VALUABLE BOOK AT COST, FOUR WORKS IN ONE VOLUME.

No. 1. "Healthy Homes and Foods for the Working-Class," by Professor Victor C. Vaughan, M.D., Ann Arbor, Mich.

No. 2. "The Sanitary Conditions and Necessities of School-Houses and School-Life," by D. F. Lincoln, M.D., Boston, Mass.

No. 3. "Disinfection and Individual Prophylaxis Against Infectious Diseases," by George M. Sternberg, M.D., Major and Surgeon United States Army.

No. 4. "The Preventable Causes of Disease, Injury, and

Death in American Manufactories and Workshops, and the Best Means and Appliances for Preventing and Avoiding Them," by George H. Ireland, Springfield, Mass.

These works won the prizes offered by Mr. Henry Lomb, of Rochester, N. Y., through the American Public Health Association, and cost nearly *two thousand dollars*. They are written in language devoid, so far as possible, of technical terms, and may be comprehended by any person or family. It is designed to distribute these works as extensively as possible among the American people, and to this end the price has been placed upon the basis of the *cost* of a large edition.

Four essays, in one volume of nearly two hundred large octavo pages, *thoroughly indexed*, printed upon extra heavy paper made especially for this edition, and bound in expensive brown cloth, with gold and black finish, making an elegant and handsome volume, \$1. (With this volume a full set of the essays in pamphlets will be gratuitously furnished to any person who will agree to present them to some institution, organization, or family where they will be carefully read.) The same, on lighter paper, well bound in cloth, 65 cents; the four essays (four pamphlets), 30 cents; any two of the essays, 15 cents; single essays, 10 cents.

These prices are for single orders, and include the prepayment of postage or express charges. A special discount will be allowed if taken in larger quantities.

These exceedingly valuable essays, written by authors of great ability, and selected, as the best out of many received in competition, by committees of award whose names alone guarantee the high character of the works, are being placed before the public *at cost*, through means that are being furnished the American Public Health Association; and it is earnestly desired that departments, organizations, societies, manufacturers, and individuals assist in distributing these essays as extensively as possible, for the good of all classes of society, especially the school children and the laboring classes.

All orders and communications in connection with the subject should be addressed to Dr. IRVING A. WATSON, Secretary, Concord, N. H.

JACK HALL; OR, THE SCHOOL-DAYS OF AN AMERICAN BOY.  
By ROBERT GRANT, Author of "Face to Face," "The Con-



fessions of a Frivolous Girl," etc. Illustrated. 12mo, pp. 396. Boston : Jordan Marsh & Co.

An entertaining book for parents, teachers, and school-boys, giving a rather exaggerated account of the relations of academic sports to study, but justifiable, because it shows the extreme length to which sports are sometimes carried to the detriment of study, while in both study and play it inculcates the cardinal virtues of truthfulness and justice.

THE SCIENCE OF A NEW LIFE. By JOHN COWAN, M.D. 8vo, pp. 405. Illustrated. New York : J. S. Ogilvie & Co. Is an indecent book of professedly good purpose with regard to the promotion of happiness by a pure life and the marriage relation, but sadly defective in matter and detail, and better adapted to the promotion of the immoralities and vices it laments than to prevent them.

BROTHER AGAINST BROTHER ; OR, THE TOMPKINS MYSTERY, by JOHN R. MUSICK, of the Fireside Series, No. 28 (\$3 per year), J. S. Ogilvie & Co., New York, is an entertaining story of the Rebellion, and a union for the better or worse, till death us do part.

THE SANITARY CONDITION OF HARRISBURG, by HUGH HAMILTON, M.Sc., M.D., from the Report of the Pennsylvania State Board of Health, is an admirably delineated description of the relations of topography to drainage and sewerage, with a view to the promotion of the health of the people.

STATE CONTROL OF MEDICINE, by LOUIS A. WEIGEL, M.D., President of the Monroe County Medical Society, Rochester, N. Y. Pamphlet reprint from "The Medical Press of Western New York." The author admits the importance of laws for the protection of the public health with regard to what is generally understood by practical sanitation, quarantine, etc., but doubts the propriety of any laws for the suppression of quackery. He cites writers of distinction against any legislation which pretends to regulate the practice of medicine by an established standard, and holds that such legislation is an invasion of the freedom of every one to choose his own physician, and take what and whose medicine he pleases. To be logical, according to this view, there should

be no restriction of the sale or administration of poisons, because if every individual has the right to call himself doctor, deceive the credulous, and administer what he pleases without regard to any required standard of qualification, his rights, as well as those who know no better than to employ his services, are encroached upon by any laws which restrain false pretences in medicine (as well as other matters), or have for their object the protection of the ignorant against impostors.

PLANT CHEMISTRY AS ILLUSTRATED IN THE PRODUCTION OF SUGAR FROM SORGHUM. A lecture delivered before the Alumni Association of the Philadelphia College of Pharmacy, February 8th, 1887, by HELEN C. DE S. ABBOTT, Fellow of the American Association for the Advancement of Science, etc. It is an interesting account of the production of sugar from sorghum, and of its economical relations in comparison with that produced from cane, beets, and maple.

IRITIS, by A. G. SINCLAIR, M.D., Memphis, Tenn., Professor of Diseases of the Eye, etc., is a concise statement of the earliest symptoms of this disease, and their importance for the successful treatment.

THE PHYSICIAN'S VISITING LIST, published by P. Blakiston, Son & Co., Philadelphia, now issued for 1888, the *thirty-seventh* year of its publication, is too well known for its superior excellence to require an extended notice. It contains everything essential to the utmost utility of its purpose, and is published in six different sizes for from 25 to 100 patients, daily or weekly, for annual use ; also perpetual edition, with special memorandum pages without dates, which can be commenced at any time and used till full. Prices, \$1 to \$3.

INTUBATION OF THE LARYNX. Papers read before the New York Academy of Medicine, by Drs. A. Jacobi, Joseph O'Dwyer, Frances Huber, Dillon Brown, W. P. Northrup, I. H. Hance, and A. Chaillé ; a pamphlet reprint from the *Medical Record* of June and July, 1887, which very completely describes and analyzes this practice, tabulates the details of 806 cases of laryngeal diphtheria treated by intubation.

# THE SANITARIAN.

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## DISPOSAL OF THE INSANE.

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ABSTRACT OF THE REPORT OF THE STANDING COMMITTEE  
ON THE INSANE, OF THE NEW YORK STATE BOARD OF  
CHARITIES, IN THE MATTER OF THE INVESTIGATION OF  
THE NEW YORK CITY ASYLUM FOR THE INSANE ON  
WARD'S ISLAND, AUGUST 12, 1887.

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THE above caption to this abstract is chosen because of the signification of the word *disposal*, with regard to dangerous refuse and the dead. It is not our purpose in this relation to compare the various means of disposal of refuse with the view of ascertaining whether the best way consists in cherishing it as a household treasure, storing it in vaults, casting it into the sea, or cremating it; but to raise the question whether any one of the means in common use for the disposal of refuse would not be equally applicable, if not, indeed, preferable to the means now generally practised with regard to the insane. The question is very broad in its application, and by no means limited to the "asylums" of New York, but equally applicable to those so-called institutions throughout the United States, and to the practice of foreign countries, whence the disposal of the insane by exportation is accomplished with as little apparent concern for their future care as for the effuse of their great seaport sewers. This investigation was undertaken at the instance of a letter from Mayor Hewitt to "The end that 'the reformation of abuses and the improvement of the management of this great charity' may be attained not so much in specific findings of facts relating to particular cases, as in conclusions regarding the general causes and con-

ditions which necessarily have given rise to actual evils and abuses in this asylum.

“The institutions for the insane, in common with all the charitable as well as correctional institutions of the city, are in charge of the Department of Charities and Correction, under Chapter 410 of the Laws of 1882, known as the ‘Consolidation Act,’ which provides for the maintenance and government of these institutions, and specifies the powers and duties of this department. The board of three commissioners, which is the head of this department, is given, and is required to ‘exercise full and exclusive powers for the government, management, maintenance, and direction’ of all said institutions, including the ‘Asylum for the Insane’ on Ward’s Island, with its branches on Ward’s Island and Randall’s Island, all of the patients wherein are men, as well as of the ‘Lunatic Asylum’ on Blackwell’s Island, with its branches on Blackwell’s Island and Hart’s Island, all of the patients wherein, excepting a few workers on Hart’s Island, are women.

“There have been for years no accounts of items of actual expenditure of these several institutions, either published or furnished to the Board of Estimate and Apportionment. . . .

“This power in the Department of Charities and Correction to procure a general appropriation for its different bureaus and institutions, by unbalanced apportionments, resembling unbalanced bids, seems to make it eminently proper that there should be annually published or filed with the Board of Estimate and Apportionment, or one of its officers, such as the mayor or comptroller, an itemized account of each bureau and institution for the preceding year.

“We present these views of the financial system, not to reflect upon the good faith or intended diligence of the Board of Charities and Correction in these respects, but to reveal what appears to us to be a fault or defect of the system; and to discover the reason, if any, for the failure hereinafter shown to induce the Board of Estimate and Apportionment to supply the necessities of this asylum for the insane on Ward’s Island.

“The rates for food and for total maintenance are given for the twelve years from 1875 to 1887, with the following results,



to wit : average daily cost *per capita* during the twelve years, for food, less than fifteen cents ; and total, including clothing, care, etc., less than thirty-three cents ; and during the year 1886, for food, thirteen cents and eight mills, and total, thirty-two cents and six mills.

“ The foregoing rates cannot be compared with returns from counties exempted by the State Board under the Willard Asylum Act, for the reason that in such returns the cost of treatment, care, and proper maintenance of the patients in the exempted insane asylums is reduced by the products of large farms, and covers only chronic cases ; and even thus the increase of such cost, over the cost of support of the paupers in the poor-houses of the respective counties, is not accounted for, but goes into the aggregates and averages of expenses of these two classes of county institutions in one account. But that the average daily cost of food and maintenance and treatment *per capita* during the last twelve years, as well as the last year, in the Asylum for the Insane on Ward’s Island is extremely low, should go without saying, under any just conception of the *status* of an insane person, as a sick patient, and not simply a pauper ; and in consideration of the fact that among the inmates of this asylum are the whole number of acute cases all requiring good food as well as care and treatment to prevent them from becoming chronic, but all in fact reduced with the chronic cases not only to one average of expense in account, but also to one common level of actual expenditures for food and service of attendants, as the evidence before us shows.

\* \* \* \* \*

“ This undue economy of expenditure for the two city asylums, which owes its continuance to defective financial methods already mentioned, and to the imperfect correspondence between the Board of Estimate and Apportionment and the Board of Charities and Correction, is intimately related to questions respecting the character of the food supplied to this particular asylum for insane men on Ward’s Island. Our inquiry is whether such food has been as good as required by

“ (1) The market and the purchase prices, and

“ (2) The needs of the patients.

“ It is in evidence, and is undisputed, that the Department

of Charities and Correction has complied with Section 64 of the Consolidation Act, by making contracts with the lowest bidders, on advertisements and sealed proposals, for all foods and other supplies, wherever the several parts of any supply together involved the expenditure of more than one thousand dollars ; excepting certain teas and other groceries purchased at private sales, which, though prohibited by the statute, appear on the testimony of the inspector appointed by the controller, to have been recommended or approved by said inspector as of general merit and for the interest of the city.

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“ The inspection of meat, fish, and milk is made on the dock at the foot of East Twenty-sixth Street by the dock-master. From an examination of the appliances there in use, as well as from the testimony of the dock-master, we are left with serious doubts as to whether the examinations are sufficiently thorough, and the means, time, skill, and care employed are such as to prevent the acceptance of unhealthy or inferior articles for consumption. It is just, however, to say, that complaints against the meat were with few exceptions confined to the cuts, which could not be better for the prices, and the cooking, which is referred to hereinafter, thus implying and sometimes expressly admitting that the meat was wholesome. The complaints against articles as stale included vegetables with fish, but the inspector as well as other witnesses, testified that the vegetables accepted had been good.

“ The proofs show that the purchase and contract prices have been within the market prices of the character and quality of food supplied to this institution.

“(2) The second branch of our inquiry relating to food, is determined by the needs of the patients in the asylum in question, and neither involves the sifting of evidence nor admits of doubt. The testimony is undisputed and cumulative, coming from discharged patients, attendants, assistant-physicians, medical superintendent, general superintendent, and each of the three commissioners of the department, and proving conclusively that the dietary is insufficient in variety and nutritious qualities. We find also that the food, with one exception, is not properly prepared. The bread is good, made as it is from mixed flours of fair quality, and baked at the

general bakery on Blackwell's Island. But the cooking in other respects is shown to be bad in fact, and made necessarily so by the inadequate appliances in a kitchen intended for 500 inmates, and made to pass through its processes called cookery, food for over 1700 patients besides attendants.

" This condition of things is wrong and shameful ; especially does it appear so in view of the fact that the patients compelled to eat the mixtures set before them, are not ordinary paupers, but insane persons, that is to say, sick persons, and many of them acute cases requiring for their recovery as well as comfort, wholesome, digestible, and nutritious food.

#### BUILDINGS.

" The unwise economy which is evident in the food supplied to this institution is exhibited in its buildings.

" The asylum building proper has a capacity of one thousand (1000) patients. But the population of the asylum at the time of our investigation was nearly 2000 patients, inadequately accommodated as follows, to wit :

In the said building .....	1,326
In the ' annex ' leased to the Department by the Commissioners of Emigration.....	339
Emigration Asylum.....	60
' Branch ' on Randall's Island.....	131
In the Hart's Island ' branch ' of the Lunatic Asylum.	60

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Making the total number of patients..... 1,916

or almost twice the capacity of the only proper building. The ' annex ' on Ward's Island and the ' branch ' on Randall's Island should be condemned as uninhabitable. The new lease of the Insane Asylum from the Commissioners of Emigration is intended by the Department of Charities and Correction for the temporary and provisional accommodation of some of this outlying population. But inasmuch as the more quiet patients are placed in the annex and the different branches, we may eliminate their number from the total census in considering the immediate problems of this extremely crowded building. Taking the minimum number 1326, we have 326 not properly provided for in this building ;

and the placing of them therein means great discomfort and injury not only for the 326, but for every one of the entire number of 1326 patients, with disgusting and dreadful crowding of the filthy and violent wards.

“The crowding of the building is not of recent occurrence, but has been continued and carried to the utmost extent for many years, causing innumerable injuries to the patients, including those direct, and others which, if not so immediate or apparent, are no less real or decisive against any good management or results. Among these indirect but determinate evils produced by this one common cause, has been the inevitable degradation of the character and service of attendants on the wards. It is not difficult to imagine the general condition, with patients huddled together, many of them without sufficient air space, in associate dormitories, and most of them deprived of day rooms, which have been filled with beds, and confined to long wards as cheerless and comfortless as are these miserable masses of humanity which crowd them. The day attendants, compelled to pass fifteen working hours in these repulsive places, and in the arduous duties of restraining and quieting the excitements which are responsive to such environments, are at night compelled to sleep two or three, and six or seven, in small and uncomfortable rooms. In this condition violent wards must become more disturbed, and filthy wards more disgusting, and the entire asylum well-nigh demoralized, even with the best material for educated attendants. But the worst effect is that while the salaries of these officers are not relatively low, the general situation repels not only the best, but even ordinarily good men, who would otherwise become applicants for their position, and attracts such as have no due appreciation, and perhaps not even a dull apprehension, of the depressing and disturbing influences to be overcome.

“This conclusion we should have no difficulty in finding from the circumstances, without direct evidence on the subject. It must be true in the nature of things. But it is established by the sworn statements of many witnesses, including not only the testimony of the commissioners and medical officers having to do with the government of the asylum, but also the cross-examination of most of the attendants who appeared



before us. Such cross-examination generally discovered antecedents not creditable for the nurses and guardians of persons who by natural law have been deprived of their reason, and by civil law of their liberty, and left helpless and remediless against any sort of trespass, be it injury or indignity. The avocation of many of these sworn attendants had been that of barkeeper. An examination is made of all ward attendants on their return to the asylum after their day out every fortnight. But such is the tendency to intoxication among them that many are discharged for this reason.

“ Now it is unjust as well as uncharitable to say that every bartender is a thoroughly depraved or untrustworthy man, without taking into account his nativity and training. It is also untrue that all the attendants in this asylum are in the general category which we have given. We believe there are good men among them. But it is safe to say that the fair presumption is against the moral or personal fitness of bartenders to fill the responsible office of attendants of the insane ; and that the proofs show that the majority who fill this responsible office are not only of questionable antecedents and character, but that many of them are decidedly rough and coarse or untrustworthy, if not positively bad.

“ The following statistics of discharges and vacancies further illustrate the position. It is in evidence before us that in the year 1886 about eighty attendants were dismissed for cause, exclusive of those resigned or honorably discharged, and inclusive of twenty-three dismissed for intoxication, including three intoxicated while on duty on the ward, and five for striking patients. These dishonorable discharges for one year embraced about one half of the staff of attendants. At the time of our examination it was shown that there were, and long had been, many vacancies in this staff which the asylum authorities were unable to fill. The general superintendent seems to have little responsibility for the selections of attendants, and to be responsible only for their dismissal, the examinations for appointments being regulated by the Civil Service rules.

“ We think the system of examinations of the City Civil Service for applicants for attendants in the city insane asylums, calling for such examinations before the nominations by the

superintendent, is less effective than the system obtaining in the State asylums for the insane, where such examinations are made after such nominations. In the City Civil Service, if there are sufficient applications, the effect is to crowd the calendar for such nominations, perhaps when less needed, leaving the surplus to wander away before vacancies occur; and whenever there is a pressing demand the effect is to retard the supply; and in all cases, the general result is to present many applicants unworthy or unqualified for the appointment.

\* \* \* \* \*

“Overworked, irritable, and ignorant attendants, who need the constant direction and discipline of persons other than themselves, and whose antecedent experiences have never resulted in self-restraint, practised by their own wills on their own nervous organisms, are placed in positions of absolute and exclusive control of badly-crowded and excited patients, without appeal or remedy except on unverified reports to absent medical authorities. The presumption that offences are continually practised by such attendants upon patients in such conditions, is of the highest degree of probability.

“This moral certainty of abuses abounding on the wards of this asylum, is, if possible, further established by evidence amounting almost to mathematical demonstration. Each of the medical officers who was examined testified to several acts of violence by attendants upon patients, which had been witnessed by himself. But though the attendants who were sworn were greater in number than the medical witnesses, and each attendant had, of course, spent a much larger portion of each day upon his ward than any medical officer upon all the wards, not one of these lay witnesses could remember a single instance of such violence.

\* \* \* \* \*

“We do not believe that these numerous trespasses upon the patients are generally of a serious nature, so far as physical injury is concerned. But they are all infractions of the rules of the asylum, and violations of the dignity and rights of the patients.

“There are other and still more numerous abuses resulting from the crowded condition of the asylum which could not be prevented by the best attendants.

“ That the abuses in the City Insane Asylum on Ward’s Island are the results of accumulations of experience, and the continued effects of long-standing causes suffered to remain against warnings, entreaties, and expostulations, is shown by references to former years, with citations which we make at length, as the responsibility for the present situation can be seen only in its relations to the past. The evils resulting from inadequate accommodations and provisions for the insane in both city asylums, have been brought to the notice of the proper authorities of the city and of the State, in many ways and for many years.”

And here follow citations from special communications and various reports by the State Board of Charities, the annual reports of the medical superintendents, and other evidence, showing the persistent improvidence by the proper authorities for the most helpless and needful of all human sufferers :

“ It is evident that the failure to provide needed remedies and reforms in this asylum is nothing more nor less than the failure to provide the requisite funds for sufficient buildings and current expenses. But where does the responsibility for this failure rest? Evidently between the Board of Charities and Correction and the Board of Estimate and Apportionment, or upon one of them. It is not for your committee to censure or reflect upon the board last named. If any criticisms are called for, it is for the public to make them upon the facts which are presented.

#### ALIENS.

“ The foreign-born population is shown to be about two thirds of the whole census of the City Asylum for the Insane on Ward’s Island. The large majority of the subjects of this asylum, thus resemble in one respect those of the State Asylum for Insane Immigrants, situated on the same island. But in other respects the differences are noteworthy. In the State asylum the patients may be presumed to have been insane on their arrival in this country. In the city asylum, on the contrary, the foreign-born population is composed mainly of men who first became insane after they landed on our shores. This is proved first by the opinion of Dr. Macdonald given on his examination before us as an expert and as the general su-

perintendent ; and, second, by the records, a transcript from which, certified by medical officer Dr. Douglas, is in evidence before us, and marked Ex. 8, July 4th. By this transcript it appears that for the year, from January 20th, 1884, to January 20th, 1885, the admissions of patients in this city asylum included 319 foreigners, whose respective periods of residence in this country are therein given in written answers to questions, as follows : Less than one year, 10 ; more than one year and less than five years, 71 ; over five years, 223, and unknown, 15. The transcript covers the subsequent time nearly two years and six months from January 20th, 1885, to July 4th, 1887, and including 939 admissions of foreigners, gives in similar form the respective periods of the residence of these patients in this country as follows : Less than one year, 17 ; more than one year and less than five years, 198 ; more than five years, 647, and unknown, 77. It thus appears that the change in the practice of receiving patients in the city asylums from the State asylum under the control of the Commissioners of Emigration, through commitment instead of direct transfer, as prior to such change, has had little appreciable effect in the statistics ; but that for the year prior to January 20th, 1885, the date of such change of practice, as well as for all the time subsequent, the number of admissions in the asylum on Ward's Island of patients who have been in the country over five years, are to the whole number of admissions therein of all the foreign born, in about the same ratio, to wit, about two thirds.

“ The result, so far as it may be relied upon, establishes the ratio of immigrants who have been in this country less than five years and have been admitted to this city asylum for insane men, to be about one third of the population of foreign birth therein, or about two ninths of the whole census thereof. It would be a violent presumption that should hold the whole number of this two ninths to be immigrants who were insane on their arrival in this country ; and we may therefore safely assume that not more than two ninths of the entire census of this asylum have been deported by governments, societies, and families abroad, and illegally landed in American ports. And this ratio, though not exact, and perhaps not very nearly approximate as to insane arrivals, is, as we show hereinafter,



the utmost undue proportion of foreign born in this asylum. This maximum is too great, of course, but it is less than the ratio sometimes assumed in discussions on this subject.

“That there should not be any residue of immigrants who are insane on their arrival, suffered to land or remain so as to become public charges upon city or State, goes without saying. Space will not admit any historical review of the general subject related to this matter, either before the decision of the Supreme Court of the United States, declaring the law of the State of New York imposing the *per capita* tax upon immigrants to be unconstitutional; or afterward and subsequent to the Federal Act of August 3d, 1882.

“This act provides that of foreign passengers to this country ‘any convict, lunatic, idiot, or any person unable to take care of himself or herself without becoming a public charge, . . . shall not be permitted to land’ (United States Statutes at Large, Vol. XXII., p. 214, § 2). Under a contract with the Secretary of the Treasury, this law has been, and is now administered by the State Commissioners of Emigration at the port of New York. Upon their vigilance and upon the rigid execution of the provisions of the act, in the fullest scope of intention as well as terms, rests the responsibility of effectually cutting off, through earnest endeavors to the utmost extent possible at the source, such illegitimate and illegal additions to the dependent populations of the public insane asylums of the city and of the State.

“The question will arise how can this residue of immigrants insane on their arrival in this country ever reach this asylum, if the Federal law to prevent their landing is properly enforced.

“The effects of all deportations by foreign local authorities, charitable societies, families and individuals, of alien criminals, lunatics, and paupers, upon the city of New York as the port of entry, are both direct and indirect, and thus doubly disastrous. Those who stay become charges upon the city. Those who go to other States may be assisted by the authorities of such States to return to New York City, as was often done in former years. Such breaches of interstate comity by Massachusetts resulted in the conference between the Commissioners of Health, Lunacy, and Charity of that State and

our State Board of Charities, held in the city of New York, November 12th, 1879.

“ Among the points brought out by this conference, are the following :

“(1st) Massachusetts had deported by State authority, exclusive of those sent out by its towns and cities, during the period from 1870 to 1878, seven thousand and five paupers to the State, and mainly to the city of New York.

“(2d) Massachusetts held New York responsible for the support of persons who have become dependent in that State, but had no settlement in New York, and had never been in New York, except as passengers in transit for Massachusetts.

“(Thirteenth Annual Report of the State Board of Charities, pp. 213 to 280.)

“ It is difficult to say how far benefit has resulted from that conference ; but if Massachusetts still continues such deportations to any great extent, they are secret and indirect, through other doorways into the State, though the intended and ultimate destination of such assisted foreign paupers may be the city of New York, as the original port of entry.

“ The State Board of Charities has from the first contributed to abate these evils of foreign and other deportations, by such conferences and correspondence with the authorities of other States and the State Department at Washington and Members of Congress, as well as in its annual reports.

“ It is in evidence that of such cases of illegal importation as have escaped the Federal Law, all which appear to come within State legislation, either the Alien Pauper Law or the State Pauper Law, are reported on information of the superintendent of the asylum, by the Commissioners of Charities and Correction to the Secretary of the State Board of Charities ; and thus to a great extent, and in the degree that the proofs will allow, this illegitimate residue illegally left under Federal legislation becomes a burden for removal by the State and ceases to be a charge on the city. So that in order to keep this residue within the least possible limits, duties unperformed under the Federal Law devolve unjust burdens upon the State of New York ; and in order to take care of this net and final residue left upon our hands, still more unjust burdens are cast upon the city of New York.

“ It is evident that to guard against these accumulated evils in the city of New York, both direct and indirect, the Federal Law must be enforced as it never has been enforced ; and further legislation by Congress may be demanded.

“ The question, however, though important in its bearings on the future, has little immediate or practical relation to the remedies now demanded in this asylum on Ward’s Island ; for, as we have seen, the immigrants who form this undue residue of the foreign population of this asylum number less than two ninths of its entire census ; while nearly one half of this census are without proper accommodation within the walls of the asylum building, which is nevertheless crowded by over thirty per cent in excess of its capacity, making the whole number of its wretched inmates, inclusive of acute cases, suffer the long train of evils consequent thereon.

“ But what shall we say of the four ninths which, with said two ninths, have been taken by us as composing the aggregate foreign-born population, which is two thirds of the total census of this asylum ? The ratio of these immigrants who were more than five years residents of this country, before they became inmates of this asylum, being about four ninths of the entire census thereof, is in proportion to the ratio of the foreign-born population of the city of New York to its entire population, according to the last Federal census of 1880, as follows : The said ratio in the asylum being about four ninths, and the said ratio in the city being about four tenths, the proportion is as ten to nine.

“ This is a favorable showing for our substantial and worthy citizens of foreign birth, the old-fashioned immigrants, who are as much interested as are native-born citizens in preventing the deportation to our shores of criminals, lunatics, and paupers of every sort. The proportion of the foreign born may be legitimately somewhat larger in this city asylum than in the city at large ; for the reason that, given the whole number of persons of neurotic temperament or tendency in any country, those who are strangers in the land will to the greatest extent through home-sickness, unaccustomed business pursuits or social frictions or other unwonted experiences, as exciting causes, naturally develop any predisposition to insanity.

“ We find therefore on this subject that, while the situation



on Ward's Island, as on all the islands under the government of the Commissioners of Charities and Correction, is suggestive of the physical and moral corruption which illegal deportations have been casting upon American shores ; the correction of these evils of illicit immigration would not be the correction *pro tanto* of the present evils in this asylum, but rather the prevention of future evils, of the same species, though of greater magnitude, which present indications prophecy.

" The facts proved show that the abuses which have continued, and against perpetual protests endured, in the New York City Asylum for the Insane, are effects of persistent causes. The difficulties which hitherto have resisted all efforts for the removal of these causes will not yield to attempts at reform on the surface of the affairs or administration of this asylum. For these causes are, as we have seen, general and inherent in the Department of Charities and Correction or in the Department of Estimate and Apportionment, or are resultants of lines of error in the relations of the two departments. Although remedial legislation for the government of these departments, as well as of all other departments of the city, should be largely determined in its principles and methods, by the people of the locality ; yet the facts are so pregnant with considerations respecting the same, that your committee make the following suggestions in the premises.

" *The remedies* to be effectual must be as radical as are the evils to be removed, and should reform from the foundation, and cut out these general and persistent causes of long-continued abuses, root, and branch. All such remedies and reforms, without losing anything radical or decisive in their nature, may be classed respectively under the two species of relief—viz. :

" A. Provisional Relief.

" B. Permanent Relief.

" A. For provisional relief, the immediate remedies demanded are proposed as follows :

" (1) The Board of Charities and Correction to give to the Board of Estimate and Apportionment, plans and specifications for all buildings and improvements, in respect of which special appropriations are asked or needed ; and also annual accounts and reports, and all necessary information for the



general appropriations, together with sufficient estimates therefor, such as are suggested herein under the heads of 'finances' and 'responsibility,' and all reasonable assurances of just and wise expenditure and administration.

"(2) The Board of Estimate and Apportionment to transfer the residue of the fund of \$60,000, to wit: \$50,000, and to make further special appropriations such as may be necessary for proper buildings and improvements on the farm at Central Islip, Long Island; and to make sufficient apportionment for temporary buildings and accommodations, as well as for the current expenses of the institution.

"(3) The Board of Charities and Correction diligently to push forward the necessary preparations for transfers of patients to the farm.

"The buildings for the accommodation of such patients to be on the cottage plan, none to exceed two stories in height, and all to be inexpensive and in accordance with principles illustrated by the Alt Sherbitz Asylum in Saxony.

"So far as the general improvements and plans will permit, separate cottages to be built without any delay or waiting for other buildings, in order to accommodate colonies of patients to be sent forward in advance.

"If such accommodations cannot be immediately provided in some of the detached cottages embraced in the general plans for the farm, then temporary structures to be erected, there or elsewhere, to relieve the crowded wards of the main building on Ward's Island.

"(4) The Board of Charities and Correction, so soon as practicable, to provide adequate, healthy, and cheerful rooms for all the patients and attendants in this asylum; to provide food of greater variety and nutritious qualities; to institute schools for the patients and training schools for the attendants, both of which are tried and successful experiments in our State institutions for the insane; to give increased facilities for healthful and productive labor of the patients on the farm and otherwise; to secure a better classification of patients on the wards; to do all in their power to elevate the office, character, and service of the attendants, by reducing their hours of duty, by increasing their means of rest and proper recreation, and so soon as improved accommodations

and conditions will create the supply, to increase the number of attendants on acute, violent, and filthy wards, and to substitute worthy and competent men in the places of the large numbers of degraded and demoralized incumbents of this, the most important office, not excepting that of physician, on the wards of this asylum.

“(5) The Board of Charities and Correction, so soon as the new conditions and environment hoped for make it possible, to provide for the treatment of the acute insane, separate from the care of the chronic insane, under the advice of the general superintendent of both city asylums, and of the State Commissioner in Lunacy.

“B. There is another class of remedies and reforms which seems to be necessary, in order to prevent the provisional corrections now to be hoped for from lapsing with the dying out of public interest and the changing of administrations; and among which, in our opinion, some of the following should be adopted for permanent relief, to wit:

“(1) Under any continued care by the city and county of New York for its insane, by permission of the State, permanent relief should be in the alternative as follows: Either the management and government of both the insane asylums, with all their various branches, to be given to a board of trustees composed of men and women appointed by the mayor, to whom they should report; or, as the alternative preferred, all matters relating to the insane to be intrusted to one independent commissioner, to be appointed by and to be responsible to the mayor; in accordance with which the Department of Charities and Correction would have to be reorganized, and might well be divided into four separate departments, each with an individual head, respectively, for (1) insane asylums, (2) institutions for children, (3) all the hospitals and the almshouse, and (4) the work-house, the several city prisons, and the penitentiary.

“(2) On the omission of the city and county to provide such permanent as well as provisional relief, the State to intervene. The county is the unit of political organization, but its insane are the wards of the State. It is the duty of the State to protect its wards, and whenever the county of their residence either refuses or neglects properly to provide for them the State should interfere.

“ The Willard Asylum Act passed April 8th, 1865, which requires counties to send their insane to State institutions, does not except the counties of Kings and New York ; but as no provision for the insane of these counties has ever been made in the six State institutions, the aggregate population and capacity whereof are less than the total census of patients in the asylums of these two counties, the powers of the State Board of Charities under the said act and supplemental acts are practically inoperative in the counties in question.

“ The Consolidation Act gives the Board of Charities and Correction power to send their patients from county to State institutions, but at an expense not to exceed present cost of maintenance in the city, or sums appropriated therefor. (§§ 46, 47, 396.)

“ It is thus evident that State care for the crowded and abused patients of the New York City Asylum for the Insane on Ward’s Island cannot be directed by the State Board, inasmuch as there is no room in the State buildings, and cannot be obtained by the local board, as there are no adequate funds at its disposal ; but must be secured, if at all, by further State legislation, for which it will become the duty of the State Board to memorialize the Legislature, if there shall be further defaults or delays on the part of the authorities and people of the city to provide the proper provisional and permanent relief.”

(Signed)

OSCAR CRAIG,  
JOHN J. MILHAU,  
EDWARD W. FOSTER,  
*Committee.*

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THE RATIO OF MORTALITY OF INFANTS UNDER ONE YEAR OF AGE TO DEATHS FROM ALL CAUSES IS BY RECENT STATISTICS : In Belgium, Denmark, Sweden, England, and Switzerland, 14.3 to 26.2 per cent. In the United States about 25. In Austria, Germany, and Russia, 31 to 48 per cent ; Petersburg, 32.5 ; Berlin, 58.1. In the city of New York, 32.2, and here three quarters of all the infants born and four fifths of all those who die before they are five years old are of foreign-born mothers.

## THE SANITARY QUALITIES OF ARTIFICIAL BUTTER.

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By JACOB R. LUDLOW, M.D., Easton, Pa.

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THE late Professor Hughes Bennett is quoted as saying that the great cause of the prevalence of pulmonary phthisis was the scarcity of good butter and the abundance of pastry cooks. The butter supply has always been inadequate. Years ago farmers and laboring men used pickled pork and bacon as fat foods, and butter only as a luxury. But nowadays everybody eats butter, whether he live in a shanty or in a palace, and the demand is so great that if we were dependent exclusively on the cow for our butter, the price would exclude it from the tables of all except those in comfortable circumstances.

Within a few years science and art have given us a substitute in oleomargerine and butterine. The skill and success that have been shown in its manufacture are quite phenomenal. It is really a triumph in its way. It is much better and more wholesome than much of the butter found in the markets. It has brought down the price of butter fully fifty per cent. The quality is uniform and the sources of supply inexhaustible. It is really a boon to the poor man and the man in moderate circumstances ; yet it is denounced and misrepresented by the dairy interest, because its extended use has diminished their profits.

It is called "stuff," and "nasty," and attempts are made to excite prejudice against it as unwholesome ; laws are passed taxing it, and more or less prohibiting its manufacture and sale. These laws and methods have chiefly one effect : they raise the price of butter, whether dairy or factory, on the consumer. They never will prevent its manufacture and sale. So long as men can make artificial butter which cannot be distinguished from dairy butter by sight, taste, or smell, so long will it be made and sold ; and legal restrictions advance the price without diminishing the profits of its manufacture.

In the interest of the masses, I think the profession should



protest against unnecessarily adding to the cost of a food so valuable and important. The rich man may enjoy his gilt-edged butter, but without this aid the poor man must be forced to use the inferior grades of dairy butter, strong, garlicky, carelessly made, and often unwholesome.

The wise fools calling themselves reformers, who, a few years ago, went about lecturing upon the injurious nature of fat as a food, did a great deal of harm in exciting a prejudice against fat ham, bacon, pickled pork, and other forms of wholesome fats; and now a delicately prepared fat, so closely resembling butter as to be easily substituted for it, is to be driven, if possible, from the market, for the sole purpose of adding to the profits of a special industry. Congress had better subsidize the dairy interest from the surplus in the Treasury than to collect this additional tax directly from the people.

It is proposed to reduce the tariff on sugar. This would very likely not reduce the price of sugar to the consumer, and if it did, so much the worse. Sugar is too cheap already, and too much is eaten for the good of the public stomach, while a palatable fat food, which the people need, is discountenanced by a prohibitory price.

I have no interest, pecuniary or otherwise, in either dairy-made or artificial butter, but as a practitioner of medicine my attention is called to forms of food that may not make a recourse to cod-liver oil so often a necessity.—*Medical and Surgical Reporter*.

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NEW TEST FOR WATERED MILK.—Szilasi, according to the *Lancet*, of June 11th, has recently proposed a new test for pump-water in milk. It is based on the fact that sulphate of diphenylamine is colored blue by the action of an exceedingly dilute solution of a nitrate. As well water always contains more or less nitrates, its presence in milk can be detected. The test is thus carried out: Twenty minims of sulphate of diphenylamine is placed in a small porcelain vessel, and a few drops of the milk to be examined are added to it. If the milk contain even five per cent of average well water, a blue tinge will gradually distinctly appear. Sulphate of diphenylamine is very cheap, so the test may be readily tried.

THE INFLUENCE OF TEA, COFFEE, AND COCOA  
ON DIGESTION.

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DR. JAMES W. FRASER, in a recent number of the *Journal of Anatomy and Physiology*, has recorded the results of an interesting series of experiments on the action of common beverages on stomachic and intestinal digestion. His observations, in the main, agree with that which is now given by the best authorities in cases of dyspepsia, and afford a strong basis of support to empirical clinical observations :

1. That it is better not to eat most albuminoid food stuffs at the same time as infused beverages are taken, for it has been shown that their digestion will in most cases be retarded, though there are possibly exceptions. Absorption may be rendered more rapid, but there is a loss of nutritive substance. On the other hand, the digestion of starchy food appears to be assisted by tea and coffee ; and gluten, the albuminoid of flour, has been seen to be the principle least retarded in digestion by tea, and it only comes third with cocoa, while coffee has apparently a much greater retarding action on it. From this it appears that bread is the natural accompaniment of tea and cocoa when used as the beverages at a meal. Perhaps the action of coffee is the reason why, in this country, it is usually drank alone or at breakfast, a meal which consists much of meat, and of meats (eggs and salt meats) which are not much retarded in digestion by coffee. 2. That eggs are the best form of animal food to be taken along with infused beverages, and that apparently they are best lightly boiled if tea, hard boiled if coffee or cocoa, is the beverage. 3. That the caseine of the milk and cream taken with the beverages is probably absorbed in a large degree from the stomach. 4. That the butter used with bread undergoes digestion more slowly in presence of tea, but more quickly in presence of coffee or cocoa ; that is, if the fats of butter are influenced in a similar way to oleine. 5. That the use of coffee or cocoa as excipients for cod-liver oil, etc., appears not only to depend on their pronounced tastes, but also on their action in assisting the digestion of fats.—*Lancet*.

## PROPRIETARY MEDICINES—SHOULD PHYSICIANS PRESCRIBE AND RECOMMEND THEM?

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“SHOULD the physician use in his daily practice a ‘proprietary’ medicine? Can he, as a reputable practitioner, recommend these preparations in his correspondence with medical journals without lowering the dignity of his profession or making himself amenable to discipline for a violation of time-honored principles of medical ethics?”

These questions have been put to this journal, and perhaps to others, with the request that they be answered editorially; and while, as put, they are very broad, admitting of much latitude in replying, we think we but voice the general opinion of those who have given the subject any thought in answering both of them, in a general way, in the affirmative.

The gist of the whole matter depends upon what is meant by the term “proprietary medicine.” In its limited and best sense we understand by the term a remedy of which the ingredients and their proportions are made known to the profession, and the trade or proprietary name of which is alone protected by law. When such preparations are made exclusively for the use of the medical profession, and are advertised exclusively in medical journals, we cannot see any possible lowering of professional dignity or deviation from “time-honored principles of medical ethics” on the part of the physician who uses them in his daily practice or who recommends them in his communications to medical journals.

The name, in this class of proprietary medicines, is to be regarded simply as the guinea’s stamp—a guarantee of the purity and genuineness of the product, and the registration of it; patenting it, if you please, is as much for the protection of the physicians who use it as for the parties who manufacture the remedy. It in no sense makes the drug a “patent medicine” any more than does the writing of “Fairchild” before pepsin, “Merck” before or after an alkaloid, or “Schering”

or "Squibb" before chloroform, transfer these chemicals into that category. These men—Merck, Schering, Fairchild, Squibb, and a few others—have devoted their lives and spent enormous sums of money in making their products the purest and best that can be attained by human honesty and human ingenuity; and as a reward their names attached in *copyrighted labels* to their chemicals stand as a perpetual guarantee to the physician and patient against the fraud and greed of less honest manufacturers; and it would be a great injustice to them, as well as to the profession and public, to deprive them of this guarantee.

The question may be and frequently *is* asked by the purists, usually by the very old, or by very young members of the medical or pharmaceutical profession, aspiring to be considered very scientific, "Why should a physician resort to these ready-made prescriptions at all? Why does he not draw upon his own knowledge of applied therapeutics, and write out his own formulæ in every case? Why does he prescribe this one's sugar-coated pills or that one's gelatin-covered granules?"

Why, indeed? Simply because he knows that these articles, being made in vast quantities, by improved apparatus and appliances, manipulated by highly-trained and educated employés, and directed by skilled chemists, can be made better, more accurately, and far cheaper than they could be compounded by the most skilful prescriptionist. He does it for the same reason that he buys a watch ready made from the jeweller or a buggy ready made from the carriage-maker.

The most serious charge that is brought against the makers of some of the best-known, most valuable, and most frequently used proprietary medicines, is that the formulæ given by the manufacturers are not the true ones, or, as Dr. Craighill, of Lynchburg, Va., in a paper read before the Virginia Pharmaceutical Association, at its last May meeting (published in the *Virginia Medical Monthly* for June, 1887), puts it, "a patented proprietary remedy which professes to publish its formulary, *but does not.*" If this charge were true, it would indeed be a grave one and a just cause for the banishment of such medicines from the list of those which the physician may use "without lowering the standard of professional dignity," etc.



But when we examine into the matter, we find the sole ground for the charge to be that when the ingredients as named are put together by the physician himself, or by the prescriptionist, off-hand, though it may be *secundum artem*, the result frequently differs very widely from the preparation which it is intended to imitate. This fact would go far to prove the charge did we not remember that in all chemical processes *manipulation* has a great deal to do with results, and that the *element of time* has a value that nothing else can supply. A mixture in which no amount of shaking will produce combination or solution off-hand, or no amount of filtration will clarify, will frequently become perfectly limpid when given the requisite length of time. We are informed by Mr. Lambert that Listerine requires eleven days in its preparation, and Messrs. Battle & Co. tell us that Bromidia, for instance, requires six days for the thorough combination of its ingredients. We have no doubt that many other such remedies require even more time for their perfection, and no amount of skill on the part of the pharmacist can possibly make up for this element in their preparation. These facts are fully recognized in France and Germany, and we find the highest class of the medical journals of these countries full of advertisements and notices of preparations exactly analogous to our proprietary remedies.—*St. Louis Medical and Surgical Journal*.

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THE MARVELLOUS RESULTS OF SOME MEDICINES, certified to by gentlemen of the cloth in the "*religious*" press, is aptly illustrated by the effects of a trade dollar, accidentally swallowed by a girl "out West," a few months ago. Her life was at first despaired of, but after some six weeks' treatment and the use of a powerful specific for swallowing trade dollars, a number of red sores broke out all over her body, and when these were opened, a copper cent was found in each. At the date of our report eighty-four cents had been removed in this manner, and her physician was hopeful of her entire recovery of the whole amount swallowed with the possibility of compound interest.

## MORTALITY AMONG LIQUOR-SELLERS.

THE mortality among liquor-sellers was the subject of a paper read by Mr. Wallace, actuary of the N. B. & M. Ins. Co., recently before the Actuarial Society of Edinburgh, in which the writer said, that of all the hazardous occupations, that of the liquor-seller—a term which he used to denote any person engaged in the retailing of any intoxicating drink—is one of the most fatal. The reports of the registrar-general conclusively showed that the mortality of persons of this class is upward of 50 per cent higher than that of the general population, and the experience of those insurance companies which have been published, the Scottish Amicable, Standard, and Law Life, confirmed this. Through the courtesy and kindness of the directors and officials of the North British and Mercantile, he was in a position to submit the result of observations recently made upon the mortality among liquor-sellers assured with that company. The observations extend over a period of sixty years, the number assured being 674, of whom 184, or 27.3 per cent, died ; 226, or 3.35 per cent, withdrew during the observations ; and 264 or 39.2 per cent, were alive at the close. These persons passed through 6398 years of life, their average age at entry being 36.82 years, and the average duration of each policy 9.49 years. A table was then given showing in quinquennial groups of ages the number of entrants exposed to risk, actual deaths, and the expected deaths by the HM table and English life table No. 3, males, the actual deaths exceeding by 50 per cent and 31 per cent respectively those expected by the two last-mentioned tables. After comparing, so far as practicable, the combined experience of assurance companies among liquor-sellers with that of the liquor-sellers of England, as given by Dr. Farr, and showing a diagram in which the results were plotted down, Mr. Wallace stated that his preconceived ideas as to the effects of selection on the mortality of liquor-sellers were completely shaken, and he was led to the conclusion that the beneficial effects of se-

lection which are so apparent in assured lives generally are counteracted by other influences to which this class of persons is exposed. With the view of ascertaining the rate of mortality in different sections, he divided the experience into three classes, of which licensed grocers, hotel-keepers, and publicans may be taken as the types.

The mortality of the licensed grocers was less than that of the hotel-keepers by 29.2 per cent, and less than that of the publicans by 43.26 per cent. The average extra premium required for assurance was 6s. 8d. per cent for licensed grocers, 17s. 1d. per cent for hotel-keepers, and £1 4s. 10d. per cent for publicans. In judging as to the risk, it is of importance to ascertain for what period the applicant has been engaged in the liquor traffic.

We quote the above from the *London Post-Magazine*, because it presents at least one feature of special interest. The comparison is made between three classes engaged in the same general line of business, but graded according to the extent of their employment. This method tends, perhaps, to eliminate other influences which might be claimed to be at work, and shows how closely the evil influence of the business follows its extent, for the presumption is that the more thoroughly a man's time and attention is devoted to this business, the greater, as a rule, will be his own personal indulgence.—*Insurance Monitor*.

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OF PAPINE, Dr. Thomas Little, of Spirit Lake, Iowa, writes : " I have been using papine for the past two months. It meets the requirements of a class in which opiates are indicated, but in which the 'remedy is worse than the disease.' One case in particular has given me a great deal of trouble for years. I have tried opium in every form, and many other narcotics, alone and in combination ; but constipation, nausea, and nervous prostration have been the invariable results. Some two months since I obtained some papine and commenced on this case with the happiest effect ; no nausea, no constipation, no prostration. I have been prescribing it in my practice since with the greatest satisfaction to myself and my patients."

TENEMENT-HOUSE REFORM.

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AT a meeting of the Board of Managers of the New York Association for Improving the Condition of the Poor, held on Monday, September 12th, the following communication was presented by the Secretary :

“ There can be no surer way for improving the condition of the poor than by improving the condition of their homes. That the present condition of the vast majority of these homes is deplorable cannot be denied. Indeed, it is not in the power of words to depict the full state of these so-called homes as they are now found in such numbers of tenements of our city. And when it is considered that statisticians estimate that before thirty years shall pass by the population of the city of New York will number four million souls, the question of the condition of the mass who will obviously reach their maturity under an influence pernicious in every sense becomes simply appalling. A street education for the youth is the only alternative. Said a mother a short time since, who had known the luxury of a large and well-appointed home, ‘ What am I to do with my boys? To keep them in the small room I am compelled to occupy would be not only dangerous to their health, but really cruel. There must be an outlet somewhere for their natural flow of spirits, and from necessity I have to let them take the chances and the dangers of the street.’

“ It is a constant subject of inquiry why there are so many deserted wives in our city ; why so many men when trouble overtakes them, run away from their homes, leaving the burden of toil and sorrow to fall upon the wife and mother ; why it is that so many men get drunk, neglect their wives, neglect their children, making their homes wretched and miserable, when those homes should be as they are intended to be, spots of earthly paradise? The answer will be found in the disposition to separate families, young children being sent to the West, a sick child or a sick father to the hospital, all resulting from the overcrowded dwellings of the masses, and



in the street influences so destructive to the tender associations of the home. Persons so reared are ill-fitted to assume the responsibilities of married life, and when such duties come to them know little of what is required of them. A poor home is better than no home, and poor nursing at home is more to be desired for the individual and the community than the most skilful nursing in the hospital.

“ These truths, which may appear somewhat trite, are made more and more clear from the result of every tenement-house inspection, and the promulgation of them by the Association must in due time produce the result now so earnestly desired by every lover of his kind. The annual reports of the Association from its organization have dwelt upon the necessity of tenement-house reform. But the report of the year 1879 may be said to mark an epoch in the Association’s history. That report produced a marked sensation, and was noticed, not only by the press generally, but also from the pulpit, and the good effects arising from it are still visible. If it should be asked where is the remedy for all this evil, it is sufficient to keep constantly before the public view the existence of the evil.

“ That improvement will come is certain. My only fear is that reform may come in a burst of public indignation destructive to property and to good morals. To guard against such a calamity is worthy the thought and study of the Association, and the right exercise of all its influence with the public.”

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THE SUCCESS OF THE ANTI-VACCINATIONISTS IS APTLY SHOWN by the results in Zurich, Switzerland, where, for a number of years until 1883, a compulsory vaccination law obtained, and small-pox was wholly prevented—not a single case occurred in 1882. This result was seized upon in the following year by the anti-vaccinationists, and used against the necessity for any such law, and it seems they had sufficient influence to cause its repeal. The death returns for that year (1883) showed that for every 1000 deaths 2 were caused by small-pox ; in 1884, there were 3 ; in 1885, 17, and in the first quarter of 1886, 85.

## THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

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By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

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(Continued from page 175.)

IV. *Mineral Springs*.—The consideration of the sources of so-called mineral waters, medicinal and commercial saline springs, has so much to do with general sanitation that it cannot be omitted in this connection any more than that of ordinary potable water, neither could it as well have been presented under the head of simple water supply. The same is true of the springs noted as being efficacious for medicinal bathing rather than, or in addition to, administration internally, as, indeed, I have already intimated. Indeed, the immediate vicinity of thermal springs so frequently affords a special local climate that I might properly include some of these medals under Section XII. The scientific medallists who have written upon this subject are numerous.

### A. ENGLAND.

Dr. Charles Giles Bridle Daubeny (1795–1867), Professor of Chemistry at Oxford. “Mineral Springs of the United States, and Geology of North America.” Transactions of Ashmolean Society and British Association.

161. Obverse. Within a double, chased circle, a sunk curved octagon, within which is suspended by a strap a ten-sided shield. Inscription: Mvn : C : Davbeny : M : D : (a rosette) Nat : Phil : Praelect : (a rosette). Reverse. Within a similar double, chased margin a depressed field, reticulated, and with similar armorial device. In centre, a full-length statue, with book, and in pensive attitude. Upon its pedestal, Newton. Legend: (rosette) Ars (rosette) Longa (two rosettes) Vita (rosette) Brevis (rosette). Bronze. 32.

This very beautiful medal, of the Daubeny foundation at Oxford, is in my collection. It was unknown to Kluyskens, Duisburg, and Rüppell, and I have never seen it described.

Professor Daubeny will be hereafter referred to in Section XII., Climate.

Dr. Anthony Fothergill (1735-1813). "A new experimental inquiry into the nature and qualities of the Cheltenham Water," Bath, no date, 8°.

162. Obverse. Bust. Antonius Fothergill, M.D. LL.D &c. J. Vining Ft. Reverse. Hygeia feeding a flame upon a serpent-entwined altar. Saluti Augustae. Soc. Med. Lond. Instituta MDCCLXXIII. Bronze. 28.

This medal was unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell. It is in the Lee Collection.

#### B. FRANCE.

Dr. Hyacinthe Theodor Baron, Jr. (1707-87), Dean of the University of Paris; Kluyskens says from 1751-54, but in reality from November 7th, 1750, to November 4th, 1754, according to MS. notes by the late Dr. Chéreau, of Paris, in my possession. "Aquae novae minerales Passiacae" (1743).

163. Obverse. Bust to right, with flowing wig and gown. Beneath, D.V. (Du Vivier.) Hy.Theod.—Baron Decanus. Reverse. An ornamental scrolled shield containing the arms of the Faculty (as described in No. 62); a blazing sun, with human face, beneath which three storks, two above and one below, bearing sprigs of marjoram, the left-hand bird looking backward, the others to the left. Legend: Urbi Et Orbi Salus. Exergue: Upon a band, Facult. Medic. Paris. 1754. Silver. Bronze.  $2\frac{3}{4}$  centim. 19.

Rudolphi, p. 11, No. 47.

Duisburg, p. 86, CCXLVI., no. 1.

Neumann, No. 31,214.

In the Lee Collection, and my own from that of Dr. Chéreau, Rudolphi erroneously considered this to be a jeton of Dr. H. T. Baron, Sr., who was dean in 1730-34. Kluyskens (i., p. 66) mentions a specimen similar which seemed to have the date 1751 instead of 1754, and he speaks of it as a distinct issue. Duisburg (p. 86) and Neumann (No. 31,213) also mention such. As, however, it does not exist in the very perfect Chéreau Collection, I raise the question, for the present,

whether the cross-bar and second upright to the 4 had not been effaced by attrition.

I give the following with some hesitation, as it does not exist in the Chéreau Collection.

164. Obverse as the last. Reverse. Sancitis A Supremo Senatu Confirmatisque Facultatis Medicinae Paris. Legibus. Exergue : H. T. Baron Decano. 1751. Bronze.  $2\frac{3}{4}$  centim.

Duisburg, p. 86, CCXLVI., no. 2.

Kluyskens (i., p. 66) says that there is a similar jeton with the date of 1754, and he is quoted by Duisburg. They were both unknown to Rudolphi. Duisburg omits the A after Sancitis which is given by Kluyskens. Rudolphi confounds this jeton also with those of Dr. Baron, Sr., and in his description omits mention of the legend in the Faculty Arms.

165. Obverse as the last two. Reverse. Minerva seated, a book in her lap, her left hand supporting a shield with Gorgon head, with her right addresses Cupid, who upholds a shield with device of three pears. To his left, D. V. (Du Vivier.) Upon the ground, various surgical instruments. Legend : Colit Et Colitur. Exergue : Acad. Reg. Chir. | MDCCLI. Duisburg has the date in Arabic numerals. Edges milled. Gilt bronze. 19.

Duisburg, Suppl. I., 1863, p. 5.

This is in my collection, from that of Dr. Chéreau.

Dr. Antoine Augustin Parmentier, of Paris. "Dissertation sur la nature des eaux de la Seine, avec quelques observations relatives aux propriétés etc. de l'eau en général." Reference to this paper appeared to me to be more appropriate here than under Section II., Water Supply. The medal of Dr. Parmentier has already been described, No. 73, under Section I. He will be again mentioned in Sections VI., Sewerage ; X., Inoculation ; and XI., Military and Naval Hygiene.

#### C. SWEDEN.

Dr. John Jacob Berzelius, of Stockholm (1779 [Rudolph wrongly states birth as in 1780] -1848). "Untersuchung der Mineralwasser von Karlsbad, Teplitz und Königswart," Leipzig, 1823, 8°.



166. Obverse. Bust. 1822. Reverse blank. Berlin iron. Bronze. 9 centim.

Rudolphi, p. 17, No. 67.

Kluyskens, i., p. 119.

Duisburg, p. 214, DLXXI., no. 1.

167. Obverse. Bust to left. Beneath, upon neck, W. Kirchner F. G. Loos Dir. Inscription: Jo. Jac. Berzelius (between rosettes) Nat Ostrogoth. D. XX M. Aug. MDCCLXXIX. Reverse. Chemical scales. Pondera Et Numeros Investigavit. Exergue: MDCCCXXX. In his description Kluyskens has Hirschner, though correct in his figure. He has dots after the name, Nat, and XX, and gives the birth year and that of striking the medal in Arabic numerals. Duisburg has also these last mistakes. Bronze.  $4\frac{1}{8}$  centim.

Kluyskens, i., p. 119, fig.

Duisburg, p. 214, DLXXI., no. 2.

168. Obverse. Bust to right. Beneath, David 1835. To left, Jo I. Berzelius. Reverse. Eck Et Durand. Bronze.  $14\frac{2}{3}$  centim.

Kluyskens, i., p. 119.

Unmentioned by Duisburg.

169. Obverse. Bust. Jacobus Berzelius. Nat. 1779. Den. 1848. Reverse. A figure leaning upon an altar, near which there are chemical apparatus, fills her patera for Hygeia, who is seated. Legend: Naturam Jussit Vires Proferre Latentes. Exergue: Fundatorum Supremo Lugens Medic. Suec. Societas. C. G. Quarnstroem Inv. P. H. Lundgren F. Bronze.

Duisburg, p. 214, DLXXI., no. 3.

This mortuary medal was unknown to Kluyskens, though issued eleven years previously to the publication of his work.

170. Obverse same as the preceding. Reverse. Isis seated, from whom a winged figure removes a veil. Beside her, chemical apparatus. Legend: Aperit Aenigmata Condita Lustrat. Exergue: Socio Longe Nobilissimo Per Annos XXX Secretario Acad. Reg. Scient. Suec.

Duisburg, Suppl. II., 1868, p. 22.

This was unknown to Kluyskens. It was struck subsequently to Rudolphi's last edition.

171. Obverse. Bust to left. Beneath, C. M. Inscription: Johann Jacob Berzelius. Nat. 20 Aug. 1779. Reverse. A

temple. Above, the blazing sun. Legend : Clara In Luce Locavit.

Duisburg, Suppl. II., 1868, p. 22.

This was unknown to Rudolphi and Kluyskens.

172. Obverse. Between oak and laurel boughs and within a beaded circle, the head of Hippocrates. Above, *ΙΙΠΠΟ. ΚΡΑΤΗΣ*. On each side of the circle, a patera and serpent and the staff of Æsculapius. Inscription : Till Minne Af Svenska Läkare Sällskapets Femtionde Arsdag 1858. Reverse. Berzelius | Gistren | Gadelius | Hagströmer | Schultzenheim | Trafvenfeld | Gahn | Svenska | Läkare | Sällskapets | Stiftare | 1808. Bronze.

Rüppell, 1876, p. 75.

Unknown to Kluyskens and Duisburg. Upon the fiftieth anniversary of the Medical Society of Stockholm. The other names upon the reverse are those of distinguished physicians of Stockholm.

Dr. Urban Hjaerne (1641-1724), Chief Physician to the King of Sweden. He discovered and described an important mineral spring.

173. Obverse. Bust to right. Beneath, A(rwed). Karlsteen. Inscription : Urb. Hiärne—M.D.Soc.Reg.Angl. Reverse. A human skull, without lower jaw, irradiated by the sun, bathed by rain descending from the armorial shield of the family of Tott, suspended in the sky, and encircled by laurel. From the right orbit a serpent creeps. Around the skull, the words Gott und Tott (God and Death, the latter word also in allusion to a noble family who had been his patrons). Legend : Vivitur Ingenio. In exergue, 1682. Gaetani has in his figure of obverse, Karlsten. Designed by Gericke, of Berlin. Gilt bronze. Lead.  $3\frac{1}{8}$  centim.

Lochner, "Samlung Merkwürdiger Medaillen," ii., vorrede, LXXX.

Gaetani, p. 120, pl. CXXVII., no. 5.

Moehsen, "Verzeichniss einer Samlung von Bildnissen, etc.," Berlin, 1771, 4° (Catalogus iconum Medicorum), p. 61.

Rudolphi, p. 74, No. 313.

Prüfend., Gesellsch. zu Halle, xi., p. 240, fig.

Kluyskens, ii., p. 34, No. 1.

Duisburg, p. 196, DXXV., no. 1.

174. Obverse. Beneath, A.K.(Arwed Karlsteen). Inscription: Urb. Hiärne S.R.Sue.Archiat.Prin. Reverse like preceding, but date 1712. Gilt bronze. 4 centim.

Rudolphi, p. 75, No. 314.

Kluyskens, ii., p. 34, No. 2.

Duisburg, p. 196, DXXV., no. 2.

175. Obverse. Bust. Inscription: Urb. Hiärne Pr. Archiat.Reg.Su. Reverse. Apollo, with his lyre, seated upon a mountain-side. Near him, L.A. Legend: Dimovet Umbram Condita Lustrat. Exergue: Medicus Poeta Mineralogus. Ob.MDCCXXIV.

Duisburg, Suppl. II., 1868, p. 17, DXXV., no. 3.

Unknown to Kluyskens.

#### D. GERMANY.

Dr. Wenceslaus Beyer (1488-1526). "Tractatus de Thermis Caroli IV. (Karlsbad) sitis prope Ellbogen," Leipsic, 1521; reprinted in 1614.

176. Obverse. Bust to left, with head bare. Inscription: Wences.Beyer.Maedi(cus). Natioe Boemus Aetatis Sueae 38. Reverse. At one side Curtius, whose horse is about springing into the abyss, from which smoke ascends. At the other, a book upon which a skull; loose bones lying about. Legend: Jam Portum Inveni, Spes Et Fortuna Valet. In field, near the horse, 1526. Kluyskens omits dots in inscription of obverse, and Duisburg has Sue. Rudolphi says that the date was absent from the reverse of his specimen. This was doubtless the effect of attrition. Silver. Iron. 6 centim. 36.

De Carro, "Carlsbad, ses eaux minerales, etc.," 1827, fig.

Bergmann, "Med. auf ber. etc. Männer, etc.," i., pl. VIII., no. 32.

*Boehmische Med.*, No. 14.

Rudolphi, p. 19, No. 71.

Kluyskens, i., p. 122.

Duisburg, p. 93, CCLXIV., no. 1.

This mortuary medal is in the Lee Collection.

177. Obverse. Bust facing, with cap, robe, and finger-ring. Inscription similar to the last. Reverse. Bier with skeleton. Legend: Cum Pariter Omnibus Moriendum Non

Tarde Sed Clare Mori Optandum. Beneath, in engraved letters, 1526 11 D. Duisburg thought that this might be P., but it probably is for Decembris. Kluyskens has a comma after Moriendum and Tarde, and Duisburg after the former. Silver. Iron. 33.

De Carro, *loc. cit.*

Bergmann, i., pl. VIII., no. 31.

*Boehmische Med.*, No. 15.

Rudolphi, p. 19, No. 72.

Kluyskens, i., p. 122.

Duisburg, p. 93, CCCXIV., no. 2.

In the Lee Collection. Figures of both of these medals are to be found in Beyer's own work, the title of which has already been given.

Dr. Jakob Hofmann, of Heidelberg (1497-1572). "Opuscula de elementis et usu medicamentorum fontium," Ulm, 1726, 8°.

178. Obverse. Bust. Inscription: Jac. Hofmann Vocatus Curio. Doctor. Aet. 40. Reverse. Coat-of Arms. Legend: Album Et Nigrum. 1537. Duisburg rightly describes but one F in the name, but indexes it with two.

Duisburg, p. 103, CCLXXVI.

Unknown to Kluyskens. Additional reference will be made to Dr. Hofmann under Section X., Epidemics.

Dr. Christopher Wilhelm Hufeland, of Berlin (1762-1836). "Nöthige Erinnerung an die Bäder in Deutschland," Weimar, 1801, 8°. "Principales eaux minerales de l'Allemagne," 1810.

The medals of Hufeland have been described under Section I., Nos. 78 and 79. He will be again mentioned in Section XI., Military and Naval Hygiene.

Dr. Thomas Jordan (1539-85). "De aquis medicatis."

179. Obverse. Bust to right. Beneath, An. Ar. (Antonio Arrondio, of Milan). Inscription: Thomas. Jordanus. Medicus. Aet. XXXI. Reverse. A scorpion, and a book, in the midst of ruins. Legend: Novissima. Virus. Duisburg omits the dots upon both obverse and reverse.

Bergmann, i., p. 109, pl. XVIII., no. 86.



Duisburg, p. 106, CCLXXXIII.

Armand, "Les Médailleurs Italiens," i., p. 271.

Unknown to Kluyskens. Dr. Jordan will be again referred to in Section X., Epidemics.

Dr. Friedrich Ludwig Kreysig, of Wittenberg (1770 [Rudolphi says 1769] –1839), Physician to the King of Saxony. "A treatise on the waters of Carlsbad, Marienbad, Ems, etc.," London, 1824, 8°.

180. Obverse. Bust. Beneath, Kiehlmann. Oak wreath. Friedrich Ludwig Kreysig | Berlin Im September 1828. Rudolphi omits the final N from the engraver's name. Iron.

Rudolphi, p. 88, No. 367.

Kluyskens, ii., p. 117.

Duisburg, p. 159, CCCCXXVI.

Dr. Franz Wirer von Rettenbach (–1844). "De thermis prope oppidum Ischl sitis."

181. Obverse. Bust. Beneath, K. Lange. Inscription: Franciscus Wirer Eques A Rettenbach. Reverse. Hygeia, Concord, and Liberality at an altar. Legend: Ex Concordia Et Liberalitate Spes. Exergue: Societ. R. C. Med. Vienn. Fundatori. S. 1843. Bronze.

Duisburg, p. 164, CCCCXLI.

Unknown to Kluyskens.

## E. ITALY.

Dr. Antonio Cocchi, of Florence (1695–1758). "Dei Bagni di Pisa," Florence, 1750, 4°.

182. Obverse. Bust to right, with flowing hair. Beneath, A(ntonio). Selvi F. Inscription: Ant. Cocchivs. Phil. Med. Anat. Antiq. Floren. Aet. L. Reverse. Hygeia with staff of Æsculapius, and Philosophy with stylus and book, seated; by them pneumatic apparatus, books, and plants. Legend: Invstrant. Comoda. Vitae. Exergue: MDCCXXXV. Duisburg gives the age in Arabic numerals. Rudolphi does the same with the date, and so does Kluyskens in his description, though not in his figure. Rudolphi and Durand have a dot after Selvi, and Duisburg omits it after Cocchivs. Bronze. 86 mill.

Gaetani, ii., p. 381, pl. 194, no. 1.

Rudolphi, p. 35, No. 138.

Kluyskens, i., p. 201, fig.

Duisburg, p. 29, LXXX.

Durand, "Médailles et Jetons des Numismates," p. 45.

Cocchi will again be mentioned under Sections VIII., Diet ; and X., Small-pox.

Dr. Bartolomeo Mesny, of Florence. "Aquarum thermalium Pisanarum analysis" (1758).

183. Bust. Inscription : Bar. Mesny. D. M. Mag. Etrv. Duc. Med. Nosoc. Milit. Praef. S. El. Pal. Me. Conj. Acad. N. N. Soc. Reverse. Æsculapius among hills, where ammonites and other fossils are seen, and an open book inscribed Hippoc. Ope. Legend : Juvando Consvmor. Exergue : I. W(eber). F. Duisburg has S. instead of Soc. upon the obverse. Bronze, cast.  $8\frac{1}{2}$  centim.

Rudolphi, p. 108, No. 448.

Kluyskens, i., p. 215.

Duisburg, p. 27, LXXIII.

There are many tokens of natural and artificial mineral and aerated waters, some of them being simply druggists' cards for soda and the like. Insignificant as these may seem, they are still connected with our subject. Not merely will they always be interesting to numismatists from the very great rarity of some of them, but they afford evidence both as to the thirstiness of the people and, to a certain extent, to the deficiency or impurity of the normal water supply. In these respects they are alike within the field of sanitarians. I will endeavor to make their enumeration so brief as not to be tiresome.

#### A. THE UNITED STATES.

184. Obverse. J. Anistaki. Good for One Glass of Soda Water. Reverse. That of U. S. dime for 1868. Lead. 12.

For my first knowledge of this token I am indebted to Mr. Lyman H. Low, of New York. It is now in my collection. I do not yet know its locality.

185. Obverse. James Aulick, N. Y. Within laurel boughs,

One Soda. Reverse. A fountain with goblets, beneath thirteen stars. German silver. 11.

This is very rare, and does not seem to have been yet described. It is in my collection.

186. Obverse. A pedestal bearing three stars. Upon it a two-handled urn, foaming over. Above, Soda Water, preceded and followed by three stars. Exergue: 1837. Reverse. Within a raised circle, Good For | \* I \* | Glass \* R.L.Baker \* | Charleston, S.C. Edges and rim milled. Feuchtwanger composition or silver. 13.

In Woodward's eighty-fourth catalogue it is given as R. L. Baker & Co. ; the error being owing to the final star coming immediately against the C in S. C. This token is in my collection. It is so excessively rare that Haseltine in the catalogue of his eighty-second sale, November, 1884, says that there are but three known. It has usually brought two dollars and a half at auction. Woodward calls it very scarce, and it was not included in the very perfect Fonrobert Collection. It does not seem to have been as yet described.

187. Obverse. Barry & M'Dannel etc., Knoxville Tenn. Reverse. Arctic Soda Water etc.

188. There is a second variety, dated 1864.

*Coin Collectors' Journal*, viii., 1883, p. 188.

189. Obverse. A.J.Blockson | (ornament) | Druggist | (ornament) | New Lisbon, O. Reverse. Above, Soda Check. Within a double embossed circle, 1. Below, \* Glass \* Tin. 13.

This is in my collection. It was not in that of Fonrobert. I have not yet seen it described.

190. Obverse. T. Brimelow, Druggist, | 432 Third Avenue, N. Y. Bust of Franklin, to right, inclosed by branches of laurel and palm, tied by ribbon. Reverse. Within a circle of stars, Good For | One Glass | Of Soda ; the lines separated by scrolls. Edges beaded. 15.

I have this rare card both in silver (Fonrobert, Nord-Amerika, No. 3049) and brass (*Ibid.*, No. 3052).

191. Obverse. Inscription as preceding. Within laurel branches tied by ribbon, a druggist's mortar, surmounted by 1. Upon either side, 18-63. Reverse as the last.

I have this also in silver (*Ibid.*, No. 3074) and in brass (*Ibid.*, No. 3078).

192. Obverse. Buffums | Mineral | Water | Pittsburg.  
Reverse. A fastened bottle within a circle of crosses. Copper. 13.

This is in my collection. The name of the State does not appear upon it, and it has been variously attributed; to Virginia (*Ibid.*, No. 5273), and to Pennsylvania (*Coin Collectors' Journal*, viii., 1883, p. 165).

193. Obverse. John L. Chapman. Within laurel boughs tied by ribbon, One | Soda. Reverse. An eagle to left, with shield, olive branch, and arrows, surrounded by thirteen stars. Silver. 11.

This is scarce, and I have not seen it described. It was not in the Fonrobert Collection, but it is in my own.

194. Obverse. Name as in preceding; at base, Baltimore. In field, (rosette) | Mineral | Water | (rosette). Reverse. In field, Medicines | And | Perfumery. Silver. 11.

This token was unknown to me until sent to me by Mr. Low. It is now in my collection.

195. Obverse. W. B. Chapman | A. M. Stevens | W. J. M. Gordon | T. B. Harris. Reverse. One Glass of Soda or Blue Lick Water. Within a circle, an ornamental fountain. W. B. Chapman | 6<sup>th</sup> and Vine (Phil<sup>a</sup>.) Nickel. 12. I have this.

196. Obverse as last. Reverse with same inscription. Within a circle, an urn. A. M. Stevens | 4<sup>th</sup> and Race. I also have this.

197. Obverse as preceding. Reverse with same inscription. Within a circle, W. J. M. Gordon | Western Row | and | Eighth. I have this.

198. Obverse as preceding. Reverse with same inscription. T. B. Harris | S. E. Cor. of | 4<sup>th</sup> and Main. I have also this.

199. Obverse. Ditman, Druggist N. Y | Soda 5. Reverse plain. Wood. 20. I have not found it described.

200. Obverse. F. Eckstein, Jr. | Cor. Fourth and Main Sts. (Cin. ?). An eagle with shield, laurel branch, and arrows. Reverse. An ornamental fountain, between growing plants. One Glass | Soda. Copper. German silver. Nickel. 12.

I have this in my collection in all the metals indicated. It was not in that of Fonrobert.

201. P. J. Garrigan Newark N. J. | Soda Water. Vulcanite.



This is in Mercer's list of the tokens made by Tilton (Num. Directory, 1884), but without description.

202. J. R. Gregory & Co. | Soda Water. Vulcanite.

Also in Mercer's list, but no description; locality not given.

203. W. E. Hagan Troy, N. Y. | Soda Water. Vulcanite.

Another of the Tilton issues as given by Mercer. It is described in *Coin Collectors' Journal*, viii., 1882, p. 57, where the name is given as Hagen.

204. Helmbold N. Y. Soda and Mineral Waters. Vulcanite.

Still another of the Tilton tokens. I have not seen it described.

205. Obverse. S. Johnson & Bro, | Druggists | Henderson | Ky. Reverse. Soda Check | 1 | \* Glass \*. Tin. 12.

This is in my collection. I first heard of its existence through Mr. Low.

206. Obverse. \* Keach \* | Baltimore Street. Within laurel boughs, tied by ribbon. One | Soda. Reverse. Below thirteen stars, an eagle with shield, arrows, and olive branch. Exergue: Baltimore. Silver. 11.

This scarce token was not in the Fonrobert Collection, but is in my own. It was catalogued as Keatch for the Woodward (Levick Collection) sixty-seventh sale, and as Leach for his eighty-fourth.

207. Obverse. A. Knight | 99 | Balto. St. (Baltimore) | \* Reverse. Within a beaded circle and scrolls, Mineral | Water. Below, an ornamental cross. German silver. 11.

This token is rare. I have it, but it was not in the Fonrobert Collection.

208. Obverse. R. H. Macy & Co. N. Y. Soda Water. In field, a large five-pointed star, in centre of which the figure 7. Reverse. John Matthews, New York. A naked boy striking with a wrench a bear which is trying to turn the stop-cock of a soda-syphon with its teeth. Exergue: 1876.

*Coin Collectors' Journal*, x., 1885, p. 103.

Matthews' own two tokens will be shortly described.

209. Edward Malley | Soda Water. Vulcanite.

In Mercer's list of the Tilton tokens (Num. Directory, 1884); locality not given.

210. Obverse. A goblet. \* C. H. Needles \* | 12 and

Race Sts. (Phil.?) Reverse. \* Good for One \* | Glass | Of | Soda | Water. Tin. 13.

Mercer, "Scarce Card List," Num. Directory, 1881.

This rare token was not in the Fonrobert, but is in my collection.

211. W. H. Peabody | Arctic Soda. Vulcanite.

In Mercer's list of the Tilton issues (Num. Directory, 1884); locality not given.

212. Obverse. E. K. Powers Grand Rapids Mich. Soda Water (1863). Copper.

Fonrobert (Nord-Amerika), No. 2490.

*Coin Collectors' Journal*, vii., 1882, p. 155.

213. H. Preissler | Louisville | Kentucky. Reverse. In field, surrounded by thirteen stars, two arrows crosswise, fastened by a band. Above and below, Soda | Water. Beneath, H. Miller & Co. | Lou. K. Edges beaded. Silver. Copper. Brass. Tin. 12.

Fonrobert (Nord-Amerika), No. 1930.

This rare token is in my collection.

214. Obverse. Prescotts | 11 | Wall St. | N. Y. | Soda Water. Reverse. 20 For A Dollar. An eagle with shield, arrows, and olive branch. Silver. German silver. 11. Scarce.

Mercer, Num. Directory, 1881.

Bushnell, "Cat. of U. S. Tokens to 1858."

*Coin Collectors' Journal*, x. 1885, p. 135.

Neumann, No. 21,808.

This is in my collection.

215. Obverse. In field, beneath a radiation, Randall & Co | Balt. Above and below, Monument | Square. Reverse. The monument. Mineral Water. | City Hotel. Silver. 11.

This rare token dates back perhaps to 1837. It is in my collection, though it was not in the Fonrobert.

216. Rushton | Soda Water. Vulcanite.

In the list of Tilton issues, by Mercer (Num. Directory, 1884); locality not given.

217. Sampson's—Ice Cream | Water. A fountain, upon which Soda. Beneath, between stars, Merriam Boston. Reverse. Z.S. Sampson, Good For etc. Tin. 18.

Not in the Fonrobert Collection, but in my own.

218. A. A. Solomon & Co. | Soda Water. Vulcanite.

In Mercer's Tilton list (Num. Directory, 1884); locality not given.

219. R. H. Starbuck Troy N. Y. | Soda Water. Vulcanite.

In the Tilton list (*Ibid.*).

220. Obverse. Suire, Eckstein & Co. \* (Cin.). In field, an open rosette. Reverse. \* Soda \* | Water. Vulcanite. 15.

In the Tilton list (*Ibid.*). It is in my collection.

221-22. Obverse. A. B. Taylor. | Walnut and Ninth Sts. Within circle, Soda Water | 1860 | Philada. Two reverses.

13.

I have both these tokens, which I have not found described. They were not in the Fonrobert Collection.

There are others sometimes considered as belonging to the above list, as, "G. W. Buck," "Benj. Jury," "Nicholson," and "Robt. Soulsby," but their being so is a matter of either inference or local history, nothing in the inscriptions showing that they are not mere tavern tokens.

In this connection, rather than under plumbing in Section II., Water Supply, should be included the following :

223. Obverse. John Matthews | Manufacturer | Of Soda-Water | Apparatus | No. 437 First Ave. | New-York. Reverse. Laureated and turbaned Liberty head, to left. In front, a dolphin. Beneath, Muller F. Inscription : Matthews Medal. Exergue : 1863. Another description gives, instead of the dolphin, a shark and eagle's head. Copper. Brass. 17.

*American Journal of Numismatics*, i., p. 80.

*Coin Collectors' Journal*, x, 1885, p. 104.

224. Obverse. Matthews Soda Water Apparatus. Device as on reverse of last. Exergue : 1876. Reverse as reverse of the Macy token, No. 208. Copper. 17.

*Ibid.*, x., 1885, p. 104.

## B. ENGLAND.

### (a) Bath, Somersetshire.

225. Obverse. F. Heath, &c. 1794. Reverse. Success To The Bath Waters, &c.

Neumann, No. 23,726.

226. Obverse. Heath. 1795 &c. West Front Of New Pump Room. Reverse as that of the last.

*Ibid.*, No. 23,727.

227. Similar to last, save P P instead of Pump.

*Ibid.*, No. 23,733.

228. Obverse. Heath. 1796. North Front Of Pump Room. Reverse as preceding.

*Ibid.*, No. 23,729.

229. Obverse. The Arms Of The City Of Bath, etc. Reverse as preceding.

*Ibid.*, No. 23,730.

230. Obverse. Walcot Turnpike Token 1796, etc. Reverse as preceding.

*Ibid.*, No. 23,731.

231. Obverse. Principal Entrance New Rooms, etc. Reverse as obverse of No. 229.

*Ibid.*, No. 23,748.

232. Obverse as last. Reverse as obverse of No. 226.

*Ibid.*, No. 23,749.

233. Obverse. Bath City Token, etc. Reverse. Cross Bath Pump Room, etc.

*Ibid.*, No. 23,752.

234. Obverse. Interior of New Pump Room Bath Erected 1796. Reverse. General Hospital Open To People Of All Countries Bath Alone Excepted.

*Ibid.*, No. 23,761.

235. Obverse. Private Baths Stall St. Reverse as preceding.

*Ibid.*, No. 23,760.

236. Obverse. Principal Entrance etc., as in No. 231. Reverse as preceding.

*Ibid.*, No. 23,762.

There are other Bath tokens still, of no interest in the present connection.

(b) *Cheltenham, Gloucestershire.*

237. Royal Old Wells. Centennial medal. 1838. Avenue with trees, etc. Bronze. Oval, 29 x 36.

Frossard sixteenth sale, October 21st-22d, 1880, No. 293.



(c) *Holt, Wiltshire.*

238. Obverse. Holt Wiltshire Mineral Water Discover'd  
1688. Reverse. Sold At The Spa House Holt etc.

Neumann, No. 24,286.

239. Obverse as preceding. Reverse. Sold By—Jno.  
Griffiths etc. London.

*Ibid.*, No. 24,287.

240. Obverse as preceding. Reverse. Holt Spa House  
etc. Holt Water.

*Ibid.*, No. 24,288.

241. Obverse as preceding. Reverse. Illustrious Duke of  
Beaufort etc. 1795.

*Ibid.*, No. 24,289.

This is one of the series of "Famine" tokens, to be here-  
after described in Section IX.

242. Obverse as preceding. Reverse. Bust of George III.  
He Feels His Peoples Wants and Relieves Them.

*Ibid.*, No. 24,290.

(d) *London, Middlesex.*

243. Obverse. For. The. Proprieters (*sic*) T. Townshend  
Alchymist To His Majesty, 1760. The Original Spaw (Spa)  
In St. Georges Fields. So Memorable In The Plague 1665.  
Beneath, T T(ownsend). Reverse. Bust to left. Beneath  
it, Miseris Succumbere Disco. Above, Lazarus Riverius. Non  
Omnibus Dormio. In the Woodward thirteenth catalogue,  
No. 1494, there is given Proprieterrr. A specimen in the  
Imperial Cabinet at Berlin is said by Duisburg to have upon  
the margin, Rob<sup>t</sup> Baker Esq<sup>r</sup> Twickenham. Silver. Bronze  
silvered. 20.

Duisburg, p. 45, CXXV.

In the Lee Collection. This will be again referred to in  
Section X., Epidemics.

C. HOLLAND.

244. Obverse. Above, Amsterdam. In field, Eene |  
Dragt. Below, two tall round vases with curved handles.  
Reverse. Onder Neming Van Gezuiverd Water. In field,  
CF. | 1828. Edges lined.

Neumann, No. 35,443.

D. FRANCE.

(a) *Salins.*

245. Obverse. An oven. Below, two branches, like antlers. Inscription, between lined circles, the first three letters in old French, Devts : Povr : La ; Povrter. + Reverse. A foliated cross with trefoil in the angles. Inscription, between lined circles, in old French letters, De : La : Savnerie : De : Salins + Fontenay. "Manuel de l'amateur de Jetons," Paris, 1854, p. 388.

Neumann, No. 31,273.

246. Obverse. Within a circle, bust of King Philip II., to right, with beard, coat, and ruff. Inscription : Phs. D. G. Hispa. Rex. Dvx. Et. Com. Bvr. followed by rosette. Reverse. The Spanish Arms. Upon either side, 15-88. Inscription : Gectz. Povr. La. Savlnerie. De. Salins.

Fontenay, p. 388.

Neumann, No. 31,274.

247. Obverse. Bust of Napoleon I. Salines De L'Est. Silver.

Sotheby and Wilkinson's Catalogue, London, June, 1857, No. 72.

(b) *Vichy.*

248. Obverse. (rosette) Etablissement Thermal (rosette) | De | Vichy | Adm<sup>on</sup> | Paris | 22 Boul<sup>t</sup> Montmartre, 22. Reverse. Vente | À | Prix Reduits | De | Toutes Les Eaux | Minerales Naturelles | Françaises | Et | Etrangères. Copper. 17.

This is in my collection. It was unknown to Neumann.

(c) *Lourdes.*

249. Obverse. Within a double curved hexagon, the votive church in a field of cross-like stars. Inscription : Sanctu-aire-De-N(otre).D(ame).-De-Lourdes. Reverse. Within a similar hexagon and with the same surrounding, the Blessed Virgin at the entrance of the Grotto. Inscription : Source-Miracu-leuse De N(otre).-D(ame).De-Lourdes. Brass. 13.

This medal is in my collection. It also forms one of another series, of which I have quite a number, those illustrative of miraculous sources and places of healing, which may be described at some future time in an entirely distinct paper.

E. GERMANY.

(a) *Altenburg, Saxony.*

250. Obverse. An eagle with the Saxon Arms. \* Hof Apotheke \* Altenburg. Reverse. Kohlen-Saueres (carbonic-acid) Wasser (rosette). In field, within a scrolled circle, Ein | Glas. Copper. 12.

Neumann's description is different from the above, and was evidently taken from a mis-strike.

Neumann, No. 32,786.

It is in my collection.

(b) *Aschaffenburg, Bavaria.*

251. Denkmal Mespelbrunn. 1847. (Julius Echter's memorial Conventions-thaler.)

I have not as yet seen a detailed description of this, and therefore admit it with hesitation, thinking that it is probably merely in honor of Echter as Bishop of Wurzburg, of whom there were a series of thalers from 1573 to 1617.

(c) *Braunschweig, Brunswick.*

252. Obverse. Within a shield, a rampant lion to left. \* G. Tiemann \* | Braunschweig. Reverse. Within an oval, Ein Glas. Outside of it, Kohlen-Saueres Wasser \* Edges beaded. Copper. Oval, 10 x 13.

This is in my collection. It was unknown to Neumann.

(d) *Chemnitz, Saxony.*

253. Obverse. A lion facing, his paw upon a pill. (Rosette) Löwene Apotheke (rosette) | V : E : Beyer | In Chemnitz. Reverse. Gultig In Meinen Trinkhallen (rosette) | 1 Glas | Kohlen-Saueres | Wasser. Copper. Oval, 12 x 15.

Neumann, No. 32,744.

This is in my collection.

(e) *Dresden, Saxony.*

254. Obverse. Between rosettes, Salomonis | Apotheke | Dresden. Reverse. Soda and Selters (rosette). In field, S. Brass.

*Ibid.*, No. 32,758.

255. Obverse. Within a beaded oval, a goblet. Ein Glas

| (rosette) Soda Wasser (rosette). Reverse. K : S : Conc :  
Fabrik | Künstl : | Mineral Wasser | Von | Gebr : (rosette)  
Reh (rosette) | In Dresden.

*Ibid.*, No. 39,860.

(f) *Hagen, Westphalia.*

256. Obverse. \* | Deo Providente | Aqvis Medicatis Hag-  
ensibvs | Hvmo Abditis Ante Se Ignoratis | Coelvm | Harlensi  
Fontanae | Aqvae Dvctv Veteri Instavrato | Et Amplificato |  
Vrbem. Reverse. Reddidit | Albertvs Wolfgang. | D. G.  
Com. Schavmbvrgi Com. | Et Nob : Dom. Lipp. Ac Sternb.  
| Operibvs Aeri Svi Nvnciis | Illo MDCCXXXIV. Hoc MDCCXL  
| De Svo Perfvnctvs (rosette). Edges milled. Silver. A  
memorial thaler.

Moehsen. "Beschreibung einer Berlinischen Medaillen-  
Sammlung, etc.," 1773, 4<sup>o</sup>, p. 209, fig.

To commemorate the discovery of the medicinal springs at  
Hagen.

(g) *Halle, Saxony.*

257. Obverse. Wellenbad | Von | Teuscher | In Halle <sup>a</sup>/<sub>1</sub>.  
(am Saale). Reverse. A building beside a garden, in which  
there is a spring.

Neumann, No. 39,907.

(h) *Halle, Württemberg (Swabia).*

258. Obverse. St. Michael's Church. In front, a small  
burning altar, at top of flight of steps. Inscription : HaLen-  
sis FVmant CaLIDis PatrIae IgnIbVs Arae. Reverse. The  
Salt Works. Inscription : IstIs Laeta DabVnt SVperI In-  
CreMenta SaLInIs. Exergue : FaVsta SaLInarVM Repara  
| tIo PIe ConCeLebrata | HaLLis CoCha | rICIs.

Moehsen, i., p. 210.

Lochner, viii., p. 33, fig.

(i) *Heilbronn, Württemberg.*

259. Obverse. A bathing-hall with seven jets. Inscription :  
Manat ADhVC SaLIens Fonte SaLVtis AqVa (rosette). Re-  
verse. Mem.Iubilaei | II | Heilbr. A scroll, under branches  
of which, 17-17. Edges milled. Silver.

Moehsen, i., p. 216, fig.



(j) *Kissingen, Bavaria.*

260. Obverse. View of the building over the springs. Inscription: Bedeckung Der Heilquellen En Ragozy | Und Pandur In Bad-Kissingen. Exergue: Aufgeführt, Und | VollenDET D.15 May | 1842. Below, at sides, T.T.Neuss Dir. —Kabausch F. Reverse. Ludwig I | König Von Bayern | Gab Diesem Kurort | Einen Abermaligen | Beweis | Seiner Besondern | Aufmerksamkeit, | Durch Die | Ganz Aus Eisen | Aufgeführte | Bedeckung | D.Heilquellen. Tin. 26.

This is in my collection.

(k) *Kreuth, Bavaria.*

261. Obverse. Bust of the king, to right. Beneath, Neuss.F. Inscription: Maximilian Joseph Koenig Von Bayern. Reverse. A monument, with bust upon it. At its base, Rein U : Segenreut Wie Diese Quelle War Sein Leben. Inscription: Dem Unvergesslichen. Exergue: Gewidmet In Kreuth. 1828. Silver.  $3\frac{1}{8}$  centim.

This memorial thaler was described by Dr. Kluyskens as a medal of "Dr. Kreuth, a physician of Bavaria" (ii., p. 216), but was subsequently shown by Dr. Rüppell (1876, p. 4) to have been struck by the town of Kreuth, a hygienic place of resort.

(l) *Leipsic, Saxony.*

262. Obverse. Trink-Halle | Des | Café Français | Glas | Mineral Wasser | 5 PFG. Reverse. Conditorei Von | W.Felsche | Leipzig. Brass. Oval.

Neumann, No. 32,771.

263. Obverse. Zum Weissen Adler | \* In Leipzig \* In field, a rosette above and below with a double diamond, end to end. Hofapotheke. Reverse. Kohlen-Saueres Wasser. Within an oval, Ein Glas. Copper. Oval, 10 x 12.

Neumann, No. 32,774. Neumann omits to give description of the reverse till a later volume, and then as No. 39,864.

This is in my collection.

(m) *Meissen, Saxony.*

264. Obverse. Ernst Schumann | In | Meissen. Reverse. Within a beaded oval, a goblet. Ein Glas | Soda Wasser (rosette). Brass. Oval.

*Ibid.*, No. 32,775.

265. Obverse. \* Apotheke | In | Meissen \* Reverse. Soda and Selters \* In field, 5. Brass.

*Ibid.*, No. 39,867.

(n) *Salztalum, Brunswick.*

266. Obverse. Two salt shovels in a St. Andrew's cross. Salzwerk Salztalum. Reverse. Between rosettes, 1 | Fuder Torf (wagon load of peat). At edge, a garland of stars.

*Ibid.*, No. 32,885.

The peat or turf mentioned upon this token is used as fuel for producing evaporation of the vats, and not, as at some of the German "Wildbäder," for medication of the baths. The purpose, however, is different from that indicated by the following token of Hamburg, where household heat and economy in cooking are alone considered.

Obverse. \* Allg.Armen Anstalt (Public Poor House). In field, 50 | Soden Torf (bricks of peat). Reverse. \* Freitag \* Brass. (*Ibid.*, No. 39,890.) Alms- or Poor-House tokens, of which I possess several, constitute an extensive group, allied to those of hospitals and medical asylums, but yet rather to be classed with prisons and other corrective and penal places of detention, as Newgate, the Bastile, and the like, which are also represented in my collection.

(o) *Trayss on the Horlof (Solms-Laubach).*

267. Obverse. Bust of the Graf Christian August. Reverse. The Salt Works. 1768. Silver.

Madaï, "Thaler-Cabinet," p. 132, No. 5876.

Moehsen, i., p. 210.

(p) *Würzburg, Bavaria.*

268. Obverse. Coat-of-Arms. Mineral Wasser Fabrik Von J. Roth \* Reverse. Gut Für Ein Glas | Selters | Oder | Soda etc. Brass.

Neumann, No. 39,790.

See also no. 251.

F. AUSTRIA.

(a) *Baden, near Vienna.*

269. Obverse. The Spring-buildings, Heiliger Quell, etc. Reverse. View of the Helenen thal. By Lange. Silver. 35 mill. Montenuovo Cat., Parts 9-14, No. 3291.

(b) *Karlsbad, Bohemia.*

270. Obverse. Man in hunting garb, with dog in water. Chamois in mountain on background. Klein Im Ursprunge Gross In Seinen Wirkungen. Entdeckung Des Heilsbader Gesundbrunnens Im Jahre 1370. Reverse. View of the city. Süßes Leben Gesundes Schönes Da Segn' Hier Fand Ich Wieder. Ansicht Von Karlsbad In Böhmen Im Jahre 1806. Silver. Tin. 27. *Ibid.*, No. 3302.

In the Lee Collection.

(c) *Klumpenbourg.*

271. Within a laurel wreath, Klumpenbourg. Badeanstalt. (Commemorative of the Opening of the Baths.) Silver.

Zschiesche and Köder, "Verzeichniss," &c., 1886, no. 1514.

(d) *Kotieschau and Teuditz.*

272. Obverse. Heads of August II., Friedrich August I., etc. Reverse. The Salt Works. 1811. Silver.

"Numophylacii Ampachiani," No. 12,446.

(e) *Teplitz, Bohemia.*

273. Obverse. Two peasants in a forest watching a wild boar that is rooting near a steaming spring. By it reclines a female figure. Reverse. View of Teplitz. 1806. By Guille-mard. 42 mill. Silver.

Woodward sixty-ninth catalogue, his private collection, No. 3877. Montenuovo Cat., Parts 9-14, no. 3309.

274. Obverse. Device as in preceding. Entdeckung Der Heilquellung Zu Teplitz. 762. G. Loos K. Fischer. Reverse. A female holding a scrolled mantle, on which a shield bearing the head of St. John the Baptist on a platter. Zur Erinnerung An Die Eilfhundert jährige Jubelfeier, 1862. Bronze. 32.

In the Lee Collection.

There is also the following, of the exact locality of which I am still in doubt.

275. Commemorative of the Kurhaus at Warmbrunn. 1865.

Hahlo, "Berliner Münz-Verkehr." Sept. 1883, no. 1395.

G. SWITZERLAND.

(a) *Aarau, in Aargau.*

276. Obverse. Bad Anstalt Aarau. Beneath, 18-. In field, within a beaded circle, 3. Reverse. A building, upon which a cross; beneath it, Bad. In front, an extended trellis. Exergue: In an oval, H R S, the first two letters conjoined. Edges beaded.

Neumann, No. 33,229.

(b) *Baden, in Aargau.*

277. Obverse. The Emperor Karl VI. and an attendant offer incense upon a tripod altar to God, represented by a radiant triangle in clouds. Inscription: Exsolvunt Grates Caesar Et Imperivm. Exergue: IanI TeMpLo BaDenae In | ARgoVIa CLaVso. Beneath, a scroll. Reverse. The city of Baden. In front, a soldier sitting by the river washes his sword. Above, a flying angel, with armorial shield, to which is attached a band, with Badena. Legend: Has Tandem Ad Thermas Fessvs Mars Ablvit Ensem. Silver.

Lochner, iii., 1739, p. 217, fig.

Moehsen, i., p. 211.

This and the following, commemorate the Peace of 1714. It has been erroneously described as of Baden-Baden, but Moehsen points out that it is of Baden in Switzerland, as, indeed, the word Argovia (Aargau) declares.

278. Obverse. Bust of the Emperor Karl VI., etc. Reverse. The pool of Bethesda, with an angel near. Primas Aqvas Favstvs Genivs Movet Inde Salvtem Et Laetam Pacem Balnea Sana Trahvnt. Exergue: Pax Badensis 7 Sept. 1714. I. W. V. Silver. Hess has Primvs (Montenuovo Cat., Parts 7-8, no. 1434).

Moehsen, i., p. 211.

H. THE STATES OF THE CHURCH.

Pope Clement XI.

279 (1713) An. XIII. Ecclesiâ Novisq. Aedibvs Ad Balnea Nucerina Constrvctis. By Ermenigildo.

Venuti, No. xxxii.



Lochner, V., vorrede, XXVIII.

Rivoire, p. 286, No. 319.

This and the following commemorate the construction of the Thermal Baths at Nocera.

280 (1714) An. XIV. Ecclesiâ Et Domibus; remainder as in preceding. By Hamerani.

Venuti, No. XXXIII.

Lochner, *ut supra*, XVIII.

Rivoire, p. 286, No. 320.

There exists an engraved token of the Bathkeepers' Guild at Hall, near Innsbruck in the Tyrol, in 1731, which shows the close relation then existing between that fraternity and surgeons.

281. Obverse. Sr. Sebastian. Inscription: S. Sewastion —Vateron der bader. Reverse. 17 deren 34 | Wundarzten | bader, balwierer | der Statt Hall in | ihnthall. Copper.

Cahn, "Periodisch erscheinender Catalog," 1885, no. 1695.

In the next Section (V.) I shall consider the medals, etc., relating to Drainage.

(To be continued.)

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## EDITOR'S TABLE.

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BALD-HEADED EDITORS.—Forasmuch as many medical editors have taken their heads in hand to draw up narratives concerning the prevalence of baldness among them, it seemeth good to us also to write of them, in order that the certainty of the causes thereof may, if possible, be better understood with a view to the use of *preventive* means, since, confessedly, there are no curative means. Considering that, with rare exceptions, all infants are born with hairless scalps, without relation to heredity, it is apparent that the hair is in some degree cultivable.

The primary necessities for a healthy growth are a cleanly and well-nourished scalp. "Dandruff," it has been well said by a distinguished author, "should never be neglected, because its natural end is in baldness." The nutrition of the

scalp just above referred to, is that which depends upon the equable circulation of the blood without inordinate stimulation. That more attention to the primary necessities of cleanliness and the maintenance of an equable circulation of the blood in the scalp in infancy and childhood, would do much toward fortifying the capillary vessels against the effects of congestion in subsequent life, consequent upon mental strain of every kind, will not be called in question by any one acquainted with the physiological law which governs the ebb and flow of the blood in relation with those parts or organs of the human body which for the time being are most actively exercised. No editor need be reminded that a hot head and throbbing temples are the penalty of too intense application, and if we may believe the stockbroker or the overworked artisan—no matter what the occupation—the same conditions apply. The practical conclusion is, therefore, that baldness is a condition of advanced civilization, in so far as advanced civilization is intimately associated with progressive mental strain: the remedy is obvious.

THE INTERNATIONAL CONGRESS OF HYGIENE AT VIENNA.—The Crown Prince, in his opening address (September 26th), declared that man was the nation's most precious capital, and that every human life represented a fixed value, which humanity commanded should be preserved and maintained intact as long as possible. The individual, he declared, was powerless against the hurtful influences surrounding everybody, and common action alone was available for the purpose of protection, and this scientific hygiene, assisted by demography, would supply. Hygienic science touched every house, every school, every town's production, every village's traffic, all industries and war.

All of the sections of the Congress are reported as having been remarkably well attended.

*International regulations against epidemics, especially the cholera*, was the subject of a particularly lively discussion in the Third Section on the second day, insomuch as to well-nigh exclude all other subjects. The conflict of opinions, as sketched in a paper read by Mr. Murphy on the previous day, came out in full force, and a sharp contest took place between

the quarantine and anti-quarantine advocates. Professor Gruber, of Vienna, who sketched the experience gathered in Austria-Hungary in 1885 and 1886, said the inference was that it was contagion through intercourse between human beings that constituted the greatest danger, but the spread of the epidemic was always largely dependent on the season and weather. Professor Gruber said he was a firm believer in Koch's bacillus theory, and an adherent to the quarantine system. Two delegates from Japan followed, who said that the cholera was always introduced into that country by English or French ships coming from China. The climax of the discussion was reached in the duel that followed between Professor Pettenkofer, of Munich, who upheld the English theory and practice, and Dr. Proust, of Paris, who advocated the old quarantine system. The former said he did not refuse to believe in the bacillus discovered by Dr. Koch, but he maintained that Koch's theory alone was insufficient to explain what had been proved by the experience of India and other countries. Dr. Proust controverted nearly everything Professor Pettenkofer had urged, and contended that for the Continent of Europe the most effective means of protection embraced the old system of isolation, dislocation, and disinfection. The debate closed with the acceptance by a large majority of five resolutions moved by Dr. Proust, embodying the ideas he had expressed in his speech.

In the Fourth Section, Dr. Csatory, of Hungary, urged that railway companies should be compelled to carry sick, and especially infected persons, in vehicles specially designed and set apart for the purpose.

*Disinfection* was elaborately discussed in a paper by Dr. Löffler, of Berlin, which we purpose publishing in full ere-long. He recommends the most scrupulous cleanliness of the patients and their surroundings in all infectious diseases; frequent and thorough renewal of the air of the sick-room, and the exclusion of all dangerous substances.

Washing in carbolized water occupies an important part in his recommendations, and steaming of clothing. The discharges of patients with infectious diseases should be received at once in vessels one quarter full of a five-per-cent solution of carbolic acid. Closets should not be used by such patients

at all ; but, if they are used unavoidably, the seats, as well as the pipes, should be cleaned at once with large quantities of a like solution of carbolic acid. Neither food nor drink should be kept in the sick-room, and no person should share the food used by the patient. Bad odors should be corrected by removing their cause and by ventilation. Attempts to correct them with matter having a more powerful odor can only do harm by concealing them.

Dr. Löffler recommends the most elaborate cleansing and disinfection of furniture of all sorts, including carpets and curtains, as well as all towels and articles of clothing which have been used about a patient with an infectious disease. All cheap things he would have burned, if they cannot be thoroughly disinfected. No patient should ever be transported in a vehicle—by land or water—which is used by the public ; nor should he go about except after a most thorough washing with warm water and soap, and in perfectly clean clothing.

The bodies of those who have died of cholera, small-pox, diphtheria, or typhoid-fever, he thinks, should be closed up in a coffin as soon as the fact of death is discovered, without washing, and wrapped in a linen cloth soaked in a five-percent solution of carbolic acid.

These suggestions, excepting so much as relate to the use of carbolic acid, harmonize with the best practical results in dealing with infectious diseases. In the strength recommended, carbolic acid is worse than useless—not strong enough to be destructive and proportionately ineffective and dangerous, because it is antiseptic of that which should be destroyed ; and, moreover, it is objectionable on account of its strong odor, obstructing the sense of smell, which is among the most useful means of detecting foul conditions. In short, there is no use to which carbolic acid may be put as a disinfectant wherein a perfectly inodorous solution of mercuric chloride, two to ten parts per thousand, is not better.

THE DISINFECTION OF RAGS continues to trouble the paper-stock importers and dealers, who show a remarkable obtuseness with regard to the responsibilities of the Health Officer of the Port of New York. The Secretary of State having



issued instructions to the consular officers at certain foreign ports directing that certificates from such officers accompany invoices of rags for shipment to ports in the United States, Dr. William M. Smith, the health officer, in order to prevent any misconception of such instructions, which might otherwise obstruct commerce or introduce epidemic disease, gave notice through the public press :

“ That the shipment of all invoices of rags should be accompanied by the certificate of the United States Consul that the rags were all gathered in a country free from contagious or infectious diseases,” where such is the case, or in lieu thereof a statement of the facts.

“ Such certificate from the United States Consul at the port of shipment is necessary to prevent delay or expenses at this port. The affidavit of the shipper or the attestation of his signature by the consul will not be considered satisfactory evidence of the healthy condition of the rags. The expression of his knowledge of the condition of the country or district thereof in which they are gathered, as respects contagious or infectious diseases, under his responsibility to the government he represents, is desired.”

This, the *Paper Trade Journal* of September 10th affects to believe, is an assumption on the part of the health officer, who “ does not appear to be impressed with the belief that the State Department is competent to instruct its subordinates at foreign ports as to the exact nature of their duties, and therefore he specifies the form in which the latter must discharge their functions acceptably to him ;” and construes the health officer's care to protect the public health into an officious act calculated to embarrass the rag-importing business.

Apropos to the importance of Dr. Smith's action, we append the following letter :

MICHIGAN STATE BOARD OF HEALTH, }  
OFFICE OF THE SECRETARY, }  
LANSING, MICH., September 21, 1887. }

A. N. Bell, M.D., 113 Fulton Street, New York City :

DEAR DOCTOR : A reliable gentleman of my acquaintance, now a resident of Michigan, but not long from England, writes to me as follows :

"In looking over the Transactions of the A. P. H. A., I noticed the papers on 'Rags' and the discussion therein. The opinion seemed to be that the origin of the bales imported could always be relied upon; but I know that large quantities of rags are landed at the Channel ports in England from French ports, and are thence sent by rail to Liverpool and Hull for shipment to America. Of course it is possible that the goods may be on 'Through Bills of Lading,' when their origin would be shown; but, on the other hand, it is also possible that they may be only manifested as shipped from Liverpool or Hull; then the identification of their origin would be lost. Of course the mode of procedure may be elicited by inquiries in England, but I thought the fact was of sufficient importance to inform you thereof."

Very respectfully,

HENRY B. BAKER, *Secretary.*

A NEW YORK BUILDER'S COMPLAINT TO THE PRESIDENT OF  
THE BOARD OF HEALTH.

NEW YORK, Oct 5, 1887.

*Mr beyless Esq*

DEER SIR i have being Ast by the owner of — — who is A widow lady to rite A Note to the bord of helgth Asking them to Disinfect her house Which i did And A. man Came up, and told her that no Person had the Right to notifie the helgth Department but the Moather of the two Childer that Died With tipterie and instead of Doing his Dutey used the Most vilent language is this the newest stile of Disinfection i have got A familey and so have all in the street hoping to heere from you And i., do hope the hole house Will be Disinfected in order that the Neighborhood might stop speaking of the Man that Canè up Resp — —

MORTALITY AND MORBILITY STATISTICS AT THE MOST RE-  
CENT DATES.

ALABAMA.—*Mobile* reports for the month of August 74 deaths in a population estimated at 31,295, of which 34 were under five years of age, representing an annual death-rate of 28.32 per 1000. From zymotic diseases there were 21 deaths, and from consumption, 10.

*Selma* reports for the month of August 34 deaths in a population estimated at 10,381, of which 20 were under five years of age, representing an annual death-rate of 39.24 per 1000. From zymotic diseases there were 11 deaths, and from consumption, 2.

CALIFORNIA.—Mortality returns from 68 towns and cities, exclusive of San Francisco, with an estimated population of 362,500, 372—"a percentage of a fraction over 1 per thousand in the month, which is the lowest death record that has yet been tabulated in the State." Consumption, 62—16.65 per cent; croup and diphtheria, 14; typhoid-fever, 25; diarrhœal diseases, 26.

CONNECTICUT.—Abstract of reports of mortality and its causes throughout the State, and specially in 28 towns of more than 5000 inhabitants, aggregating 454,400 during the month of August: Total deaths, 848, representing an average annual death-rate of 22.3 per 1000. Deaths under five years, 348. No fatal epidemic was reported from any part of the State. The deaths from zymotic diseases were as follows: Cerebro-spinal-fever, 14; diarrhœal diseases, 406; diphtheria and croup, 39; erysipelas, 3; malarial fevers, 21; measles, 1; scarlet-fever, 11; typhoid-fever, 21; whooping-cough, 6; consumption, 118—13.9 per cent of the total mortality. "Pneumonia keeps equal pace with typhoid and malarial fevers, and claimed 21 victims." The *lowest* death-rates were in Wallingford, 6.5; Windham, 7.2; Middletown, 11; Enfield, 12; Stonington, 12. The *highest* death-rates were in Southington, 34.9; New London, 33.2; Bristol, 31.4; Waterbury, 31.2; Groton, 30.3.

DELAWARE.—*Wilmington* reports for the month of August 119 deaths in a population estimated at 57,000, of which 66 were under five years of age, representing an annual death-rate of 25.05 per 1000. From zymotic diseases there were 23 deaths, and from consumption, 14.

GEORGIA.—*Savannah* mortuary report, by J. T. McFarland, health officer for 1886, shows, as heretofore, an excessively high death-rate among the colored population, even in the

absence of any prevailing epidemic. By the census of 1885-86, population—whites, 26,675 ; colored, 19,111—45,786. Deaths—whites, 452 per 1000, 17.32 ; colored, 936 per 1000, 48.97 : aggregate, 20.44. The principal causes of death named in the order of their greater prevalence were : Consumption—white, 49 ; colored, 107—156 ; pneumonia—white, 16 ; colored, 74—90 ; fevers—malarial, remittent, congestive—white, 32 ; colored, 53—85 ; cholera infantum—white, 23 ; colored, 34—57 ; marasmus—white, 25 ; colored, 29—54 ; trismus nascentium—white, 4 ; colored, 39—43 ; inanition—white, 12 ; colored, 30—42 ; dropsy—white, 11 ; colored, 28—39 ; measles—white, 8 ; colored, 36 : 44 ; typhoid and typho-malarial fevers—white, 15 ; colored, 20—35 ; infantile convulsions—white, 11 ; colored, 23—34 ; teething—white, 3 ; colored, 23—26 ; accidents and violence—white, 6 ; colored, 17—23. Still and premature births—white, 26 ; colored, 149—175. Deaths from undefined causes—white, 13 ; colored, 82—95. Deaths without physician in attendance—white, 14 ; colored, 240—254. The causes named account, for the most part, for the excessive mortality of the colored race, and the last—without physician in attendance—is the more remarkable, since “ charity physicians and free medicines are offered them by the city authorities, which they refuse to accept. Hospital accommodation is also rejected, except in cases of serious injury, or when they are turned adrift by their kith and kin, in consequence of old age or chronic diseases. . . . Statistics prove, beyond question, that prior to the emancipation of the negro race the death-rate was not greater—in fact, it was smaller in Savannah than that of the white race.”

The sanitary condition of the city is reported good, the drainage of the low lands improved, privy vaults have been well looked after, and nuisance complaints few. The water-supply continues objectionable, but we are gratified to observe that boring for water with intent to supply the city with artesian well water, which we took occasion to urge eight years ago, is earnestly recommended as a subject of the first importance, in view of the continued menacing attitude of cholera, and the constant sewage of privy vault and surface filth into numerous city pumps still used for drinking-water.

The efficiency of the Sapelo Quarantine Station is especially



commended, and obligations acknowledged to Surgeon-General Hamilton for much valuable information on sanitary interests during the year. The health officer again takes occasion, as he did in his previous report, to remark upon the untrustworthiness of the consular reports in regard to epidemic diseases abroad, and refers in particular to the report of Mr. Horatio J. Sprague, United States Consul at Gibraltar, who, on August 24th, 1886, gave a clean bill of health to the steamship *Sylvia*, clearing for Savannah, stating that "there was neither cholera," etc., "nor suspicion of same at that port" at the time, notwithstanding a case had been reported only six days before, and eleven cases had previously occurred within a short period. Four days subsequently another case was reported, showing the continuance of the disease at that port. Mr. Sprague's reason for giving a clean bill under the circumstances, was that, "The consuls at Gibraltar had met, and decided to give clean bills of health," and this explanation, he said, was satisfactory to the United States authorities at Washington. Other instances are cited which show that Mr. Sprague's conduct was inconsistent though not exceptional; on the contrary, it is a fair specimen of the untrustworthiness of our consular reports, and eminently suggestive of the necessity of the utmost degree of vigilance and thorough inspection of all foreign vessels by our port health officers.

*Augusta* Board of Health reports, for 1886, continued progress in the drainage and sewerage of the city, and the urgent need of it. There are yet 5689 surface privies saturating the soil with filth, and reeking their noisome odors. Defects in a large sewer in the very centre of the city, which have for three years depended upon an obligation of the Columbia and Augusta Railroad for correction, still remain, sustaining epidemic conditions, by the neglect of the proper authorities to enforce the legal obligation. Three thousand five hundred and eight feet of pipe sewers have been built during the year, in continuation of a definite plan which contemplates the entire city, that has thus far proven to be entirely satisfactory, wholly devoid of such obstructions as have heretofore obtained in the old sewers. Considerable progress has also been made in soil drainage in connection with the new and repairs of the

old sewers. Meanwhile, as well shown by the reports of the sanitary inspectors, the Board of Health maintains a high degree of efficiency in contending with a multitude of nuisances, which for their ultimate disposal depend upon the completion of the excellent sewerage and drainage now in progress.

Births registered during the year : White, 365 ; colored, 486 : 851. Birth-rates per 1000 of population : White (20,500), 17.8 ; colored (15,500), 31.3 : 23.6.

Deaths registered during the year : White, 388 ; colored, 525 : 863. Death-rates per 1000 of population : White, 16.48 ; colored, 33.86 : 23.97. Four hundred and fourteen of the deaths—144 white and 270 colored—or nearly one half of the total number, were under five years of age. Two hundred and thirty-six—100 white and 136 colored—or 27.3 per cent of the total number, were caused by zymotic diseases, as follows : Diarrhoeal diseases, 109 ; fevers, 92 ; measles, 28 ; croup and diphtheria, 6 ; catarrh, 1.

ILLINOIS.—The quarterly meeting of the State Board, Chicago, July 8th, was the first under the new law, remedying the defects of the original Medical Practice Act of 1877. The Secretary presented a summary of the practical work of the Board under the enactment. "When the law went into effect there were 1923 physicians in the State who were not qualified, and therefore could not comply with its provisions. Of these by far the greater number left the State, others abandoned practice, while many qualified themselves and graduated or passed the examination of the Board. In addition to this number, the Board refused during the year 1878, 278 applications for certificates ; in 1879, 175 ; in 1880, 154 ; in 1881, 127 ; in 1882, 111 ; in 1883, 98 ; in 1884, 85 ; in 1885, 75 ; in 1886, 73 ; and thus far in 1887, 25—making a total of 3129. Of this number 640 had diplomas from schools that sold them or which graduated upon a mere nominal examination. . . . It was the first time that different schools of medicine were placed upon the same Board—ostracizing none, but requiring from all certain fundamental knowledge—the only question asked being whether they could comply with the spirit and intent of the law. The result of this course has

been to remove many prejudices ; and if the same policy is pursued in the future, the day is not far distant when those engaged in the practice of medicine will simply be known by the title of physician. . . . The necessity for such action will be appreciated when it is stated that before this requirement was exacted, the evidences of a want of preliminary education and training were so apparent in the correspondence of the Board that it is safe to assert that there were at least 700 graduates in the State who did not know how to spell the word diploma, the talismanic parchment upon which they laid so much stress as a guarantee of their professional knowledge and standing.

*“ Quacks and Itinerants.*—When the law went into effect there were 78 travelling doctors, visiting different portions of the State, who, by their fraudulent promises to cure, took from the sick, afflicted, and credulous not less than \$225,000 annually. Many of these quacks had their headquarters in other States, from which they made periodical visits into Illinois to fleece its citizens.

*“ Midwives.*—The result of the work has also been very beneficial upon the character of the midwives. During the past ten years the incompetent among this class have been very largely weeded out, and only graduates of good schools or those who pass a thorough practical examination are now granted certificates authorizing them to practise the art.”

The chief point of the new law is the provision against the “exempts,” as Dr. Rauch calls them, the practitioners who opened business ten years before the existing act went into force—those who have been practising medicine continuously for ten years within the State prior to the taking effect of the act. “All persons holding a certificate on account of ten years’ practice shall be subject to all the requirements and discipline of this act, and the act to which this is an amendment, in regard to their future conduct in the practice of medicine, the same as all other persons holding certificates ; and all persons not having applied for or received such certificates within six months after the taking effect of this act, and all persons whose applications have for the causes herein named been rejected or certificates revoked, shall, if they shall practise medicine, be deemed guilty of practising in violation of law, and



shall suffer," etc. It is our purpose to print the act in full in a future number.

The sanitary condition of the State was reported to be fairly satisfactory, though much yet remains to be done in the improvement of water-supplies, the disposal of night-soil, garbage, sewage, etc. The house-to-house inspection is still being pushed in many localities, and the sanitary survey of cities and towns has reached quite respectable proportions.

*The sewage disposal problem of Chicago* seems to have resolved itself thus far into the following propositions :

1. The pollution of the main waterway and the necessary dilution which should be secured.

2. The physical effects upon the Des Plaines and the Illinois rivers of turning a large quantity of water from the lake into their beds in addition to that already carried.

3. The study of the velocity of the water in the proposed channel as to the economic construction of the same, and its effect upon navigation.

4. Finishing of all maps and plans and the compilation of all data, and their presentation in a systematic report for permanent use.

*Rock Island* reports for 1886 : Deaths, 149—18.8 per 1000 of population. It is interesting to note that on the organization of the Health Department of this city, 1881, the mortality for that year was 288 ; in 1882, 225 ; in 1883, 154 ; in 1884, 170 ; in 1885, 159. The Commissioner remarks on this showing, that previous to and at the time the department was organized, "disease prevailed to an alarming extent, the city was filthy, on damp nights it smelled like a monstrous privy vault. Good citizens left us because they had so much sickness, the traveling public avoided us for fear they would get sick ; work at our manufacturing establishments and shops was constantly being interfered with on account of the sickness of the men. The United States Engineer Corps left us on account of the unhealthfulness of the city, and our death-rate was as high as any published report of any city anywhere. Under such circumstances the 'Cable Ordinances' were adopted. . . . I hear that some are suggesting a return to the old system—probably thoughtless remarks made without consideration. Surely no real friend of our city, now upon the eve of an era



of prosperity, would think seriously of stepping backward. Such a move would be municipal suicide."

For four weeks ending August 27th, 14 deaths in a population estimated at 13,655, of which 5 were under five years of age. Death-rate, 13.3 per 1000. From zymotic diseases there were 6 deaths, and from consumption, 2.

INDIANA.—The State Board of Health Report for the fiscal year ending October 31st, 1886, opens with a just tribute to the late Thaddeus M. Stevens, M.D., the first secretary of the board, and who was mainly instrumental in creating it. Each county in the State has a "Board of Health," but on account of needful provision to pay a health officer, many exist in name only. A Convention of Town, City, and County Health Officers, held in the early part of the year (the proceedings of which being here reported), appears to have had an excellent effect in increasing public interest in the health service, and stimulating the beneficiary service of health officers. It also initiated a praiseworthy work in exposing and correcting the bad plumbing of the State House. Schools and school-houses have continued to receive the attention of the board, and considerable progress has been made in their sanitation; and the public buildings generally—State House, asylums, hospitals, and prisons—have been carefully looked after and preventive measures instituted without waiting for fatal results of well-recognized means of insidious manslaughter.

In the summary of vital statistics, of a total of 15,223 deaths registered within the year, 3733, or 24.53 per cent, were caused by zymotic diseases; and of these, 16 per cent were by typhoid-fever, 14.3 by cholera-infantum, 10 by diphtheria, and 5.7 by croup. Of small-pox, there were but 3 cases, with 1 death. The death-rate is approximately estimated at 18 per 1000. Births registered, 38,310; marriages, 17,657; the ratios to population are not estimated.

"The Influence of the Mind over Physical Diseases," "Moral Instruction and Schools for the Insane," "Poor Asylums," "Influence of Mental States on Physical Health," "Baths and Bathing," "Water," and "Is Mammon Greater than Hygeia?" are the subjects of educational essays and

addresses promotive of the public health. Appended is a list of the physicians in the State, and a report of the proceedings of the National Conference of the State Boards of Health, in Toronto, October, 1886.

IOWA.—October *Bulletin* reports for the previous month :

*Davenport*, with a population of 23,830 : Deaths, 31 ; under five years, 12 ; from diphtheria, 10—nearly one third of the whole numbers of deaths from all causes. “ Monthly death-rate, 1.1.” During the previous month there were reported 31 cases of diphtheria, and 7 of scarlet-fever.

*Des Moines*, with a population of 35,000 : Deaths, 44 ; under five years, 4 ; from zymotic diseases, 11, 5 of which were from typhoid-fever. “ Monthly death-rate, 1.9.”

*Keokuk*, with a population of 14,000 : Deaths, 14 ; under five years, 5 ; from zymotic diseases, 4. “ Monthly death-rate, 1.0.” “ Monthly” death-rates are not an average standard. The above, for example, are for thirty days, and consequently not reducible to the annual rate by multiplying by twelve. A far better criterion is that which is almost universally used, the average *annual* death-rate for the time being.

LOUISIANA.—*New Orleans* reports for August 328 deaths in 176,500 white population, and 169 deaths in 66,250 colored population, making the respective death-rates 22.30 and 30.61 per 1000, and 24.56 for the whole population of 242,750. The deaths from zymotic diseases numbered 95, and from consumption, 66. There were 175 deaths under five years of age.

MAINE.—The Second Annual Report of the State Board of Health for the year 1886 opens with a sketch of sanitary legislation in general, followed by that of Maine's most recent Act in particular, to establish local Boards of Health in every city and town in the State. The chief infectious diseases with which the board had most to do during the year were diphtheria and typhoid-fever, found to be due to the usual causes—excrementitious filth-storage and seepage. “ In many of the houses and tenements” (in Brunswick) “ in which these diseases occurred, . . . the sanitary condition generally was of the worst possible kind. It resulted from an entire absence of any systematic method for removing and dis-

posing of the various wastes which occur in such a population." In this community of about 1650 inhabitants there were during the year 78 deaths, of which 56 were caused by zymotic diseases. The death-rate was 47.2. In Van Buren and several other towns the conditions and results were almost equally bad.

Diagrams illustrate several of the towns' reports, showing the relations of the privy vaults, pig-pens, and stables to the wells, usually less than thirty feet distant, and not unfrequently at the lowest point, as if intended for a filth receptacle. Under the head of "Various Sanitary Topics" the secretary, Dr. A. G. Young, discusses subjects of abiding interest. Dr. I. O. Webster (member of the board) contributes a paper on "Water Supply, Public and Private," describing the common dangers and means of purification. The "Contagiousness of Consumption," "Bovine Tuberculosis," "Healthful School Rooms," and "Summer Resorts" are all discussed in a way well calculated to be of interest to the public, among whom the report is eminently worthy of the widest possible distribution.

Under date of July, 1887, the State Board issued the first number of the *Sanitary Inspector*, 25 cents a year, a pamphlet of twelve pages, to be published monthly as "a medium of communication between the State Board and the local boards. . . . It is hoped to make this journal live without cost to the State, and therefore without letting it draw upon the appropriation of the board; . . . a few pages of advertisements are inserted." It gives such extracts from current literature and notes on sanitary subjects as are intended to promote the public health by the diffusion of information.

We are very much inclined to think, however, that this increasing tendency of our State Boards of Health—for that of Maine is not the only one—to become journalistic bureaus is not only a diversion of their duties under the laws, but a mistaken means of accomplishing their intended purpose. They can with less effort and better effect make use of the public press as the means of communication between themselves and local boards, and of giving publicity to their own work for the promotion of the public health, than they can by undertaking the work of journalists.

MARYLAND.—*Baltimore* reports for four weeks ending August 27th 690 deaths in a population estimated at 437,155, of which 392 were under five years of age. Death-rate, 23.8 per 1000. From zymotic diseases there were 286 deaths, and from consumption, 74.

MASSACHUSETTS.—The Eighteenth Annual Report of the State Board of Health, 1886, pp. 420, is the first report of the Board since the return to its pristine condition. The Board rejoices at its return to the broader field of inquiry than that to which it has been restricted for the last seven years, by its jointure with lunacy and charity, and enters upon its duty with some of the old-time vigor which characterized its first work under the leadership of Bowditch and Derby, and their worthy associates. "The business of investigating and gathering information as to any matter pertaining to the public health, and of diffusing such information among the people," is set forth as the comprehensive purpose of the Board, by its ready grasp of the uppermost subjects of the time in that connection. The causes and prevention of infectious diseases, the suppression of nuisances, the collection and diffusion of information relative to industrial hygiene, the hygiene of schools, the examination and investigation of water-supplies and public ice-supplies, the investigation of drainage and sewerage systems, the disposal of the dead, the inspection of food and other articles affecting the public health, inquiries into the causes and means of preventing insanity, inquiries relative to the amount of intemperance and the remedies for it, the protection of human life and investigations as to the infectious diseases of animals, are special subjects of inquiry, and some of them at considerable length. Water-supply and sewerage are very properly the first subject of consideration by the Board, and by a brief report of the Chief Engineer, F. P. Stearns, covering four months' investigation only, since the law placing the purity of inland waters, etc., under the supervision of the Board, but sufficient to show the wisdom of the Legislature in this direction. Examinations of the water of the Merrimac River, above and below Bradford, Lowell, Lawrence, and Haverhill, show dangerous pollution at all places and times, though "the amount of impurity in the



water in its natural state varies greatly in a comparatively short time—often as much as the whole amount of impurity added by a large city. This statement refers to the *amount* of impurity as determined by chemical analysis, and not to its deleterious qualities. . . . The volume flowing in the river, and consequently the degree of dilution of the sewage, varies largely. Even during twenty-four hours of the low water of summer, the volumes flowing below Lowell and Lawrence in the day, while the mills are running, are several times as great as during the night. After the mills stop the domestic sewage from the cities continues to flow for several hours into a diminished volume of water.” The results are tabulated, and “the amount of sewage now put into the river at Lowell contains enough solid matter in solution to increase the amount in the Merrimac River to an extent that can be easily detected by chemical analysis . . . before reaching the point where the sample is taken.” Nothing better shows the wisdom of the act, in making it incumbent upon all cities and towns hereafter contemplating water-supply and sewerage works to submit outlines of their plans to the judgment of the State Board of Health. Next follows :

“An Inquiry into the Transmission of Infectious Diseases through the Medium of Rags,” by Charles F. Withington, M.D.) of which we have also received a pamphlet reprint, comprising sixty pages of the volume), differs in several important particulars from the Report of the Committee of the American Public Health Association on the same subject (see *THE SANITARIAN*, Vol. XVIII., p. 293), though covering the same ground, apparently influenced by the commercial aspect of the question as represented by the steamship agents of Boston, the paper-mill companies of Holyoke, and other paper-stock dealers in Massachusetts. For example, with regard to the sources of foreign rags sent to this country in 1884 : “England, 28,000 tons ; Germany, 25,500 ; Scotland, 6500 ; Italy, 4500 ; Belgium, 4000 ; the Netherlands, 3000 ; Africa, 2000 ; France, 1500 ; British Provinces, 1000 ; British East Indies, 1000 ; Japan, 1000 ; Turkey, 1000 ; Spain, 500.” It would surely be an injustice to the author of this report to suppose him ignorant of the testimony of consular and other credible reports, that this

summary is no indication of the prime sources of those rags ; that from England, especially, the excess is due to her prohibition of landing rags there brought from Spain, Italy, and other countries, where infectious diseases were known to be prevalent, and that on the arrival of such cargoes at her ports, she gave them new clearances (without unlading), and thus became the largest exporter. Moreover, evidence is equally accessible that Spain, Italy, and France are among the largest producers of rags, which find their way to the United States indirectly through the collecting warehouses of Germany. Again, the inquiry appears to have been based at the outset upon the statement of counsel representing the rag trade of the State, who have, in their effort to overcome the restrictions of quarantines, confessedly assisted the author in the production of this *partial* report, which accounts for one of his very extraordinary conclusions, that rags are much less likely to convey infectious diseases than clothing packed in an infected locality and after transportation unpacked, because "*rags if transported to this country are certain to have undergone a careful discriminative sorting and drying, and to have spent a considerable time in warehouse and on ship board.*" Such a statement could never emanate from a disinterested *observer*, who had acquired knowledge of the condition of baled rags and of what they consist when opened before him on arrival in this country, or even at the paper mills. For every such observer knows that baled rags are not only in general abominably filthy, but that, though technically "rags," they not infrequently consist in part of the confessedly more "dangerous textile fabrics" merely packed in as part and parcel of the outthrow common to infectious diseases—a condition which the author of the report recognizes by citing a law in Great Britain imposing a penalty on the selling or giving away of infected clothing from persons sick with infectious disease, in the face of his nice distinction between such material and rags from other countries, where no such law obtains. Indeed, the description of imported rags above given (which we have italicised) bears evidence of observations limited to exhibits by traders who have no regard for the public health, and who are careful to sort their samples for superficial observers. That there are exceptions—some

dealers who are conscientious and scrupulously regardful of cleanliness—is no less true than the generally recognized danger of infectious diseases by this means by sanitary authorities, even to the extent of wholly excluding them at times when epidemics prevail, as the health authorities of England did in 1884 ; but to deduce conclusions from and base rules of action upon the exceptions described is preposterous. And equally so is the effort to impair the evidence of frequently occurring epidemics of infectious diseases in towns where infected rags have been admitted into paper mills, by citing a larger number of towns without paper mills (but other causes in abundance) where similar epidemics have prevailed—another remarkable fallacy of this special report.

The death-rate of the population of the chief cities and towns contributing to the report, as calculated from the census of 1885, was 19.46. The ratio of deaths of children under five years of age to the total number was 33.9. From consumption, 3558—161.09 per 1000 deaths from all causes ; 3.13 per 1000 of the living population. From typhoid-fever, 407—18.4 per 1000 deaths from all causes ; the average annual mortality from this disease per 1000 deaths for the decade 1861–70, was 46.9 ; 1871–80, 31.7. Of small-pox, there were but 3 cases only, with 1 death. One was a recent arrival from Canada, 1 from New York, and 1, “ a man who had been dusting rags in the paper-mill,” from Ireland a few months before. “ From this case came 2 cases of varioloid.”

*Boston* reports for the month of August 976 deaths in a population estimated at 400,000, of which 467 were under five years of age, representing an annual death-rate of 29.2 per 1000. From zymotic diseases there were 328 deaths, and from consumption, 118.

MICHIGAN.—For the month of August, 1887, compared with the preceding month, the reports indicate that dysentery, typho-malaria-fever, and remittent-fever increased, and that no disease decreased in prevalence.

Compared with the average for the month of August in the nine years, 1879–87, dysentery was more prevalent, and intermittent-fever, consumption of lungs, and diphtheria were less prevalent in August, 1887.



Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of August, 1887, at forty-nine places, scarlet-fever at twenty-eight places, typhoid-fever at forty-nine places, and measles at ten places.

Reports from all sources show diphtheria reported at thirteen places more, scarlet-fever at three places more, typhoid-fever at thirty-three places more, and measles at seventeen places less in the month of August than in the preceding month.

Compared with the preceding month the temperature in the month of August, 1887, was much lower, the absolute humidity less, the relative humidity and the day ozone were about the same, and the night ozone was less.

For the month of August, 1887, compared with the average of corresponding months for the nine years 1879-87, the temperature was slightly lower, the absolute humidity slightly less, the relative humidity the same, and the day and night ozone were less.

*Detroit* reports for the month of August 338 deaths in a population estimated at 200,000, of which 97 were under five years of age, representing an annual death-rate of 19.89 per 1000. From zymotic diseases there were 134 deaths, and from consumption, 21.

MINNESOTA.—*Bulletin* for August contains recent laws for the prevention of the spread of contagious diseases among cattle, horses, and other domestic animals; to regulate offensive trades and employments; to prevent the pollution of rivers and sources of water-supply, and to provide for the collection of vital statistics; evincing such confidence in the State Board of Health and conferring such plenary power upon it as to show the most enlightened appreciation of the economy of human life, and the importance of an effective health service as the best means of promoting it.

*Infectious diseases* reported during the month of August :

Diphtheria, 40 cases, 11 deaths; scarlatina, 34 cases, no deaths.

*Diseases among animals* : Cases of glanders remaining isolated or not accounted for, 26; reported during the month, 16; killed, 5; released, 2. Remaining August 1st, isolated or not accounted for, 35.



*Poisoning by Smoked Sturgeon and Pressed Beef* is the subject of an interesting report in the *Bulletin* for June, by Dr. F. R. Mosse, Health Officer of Rochester, who was a severe sufferer in person and in his family. He gives a detailed statement of the process of catching and curing of the fish from Mr. Brown, the founder of this industry at Wacouta, with another statement from the partner who sold the fish which occasioned the sickness, of which he, too, was a victim. The sample sent to us was already in varying stages of putrefaction, and no difficulty was found in isolating—from a selection of the best of it—a crystalline product which responded to all the chemical and physical tests which determine the existence of the so-called ptomaines. The process of curing is a combination of steaming and smoking, thoroughly empirical in method, and uncertain in result. The fish were kept on ice by the firm, in their delivery wagon, till delivered to consumers or retail dealers. These last do not, as a rule, keep the fish on ice, but treat it as smoked halibut, which is much more perfectly cured. Consumers do the same. The Wacouta firm make a rule to inform all purchasers that ten days to two weeks is the limit of good condition, but it does not appear that retail dealers are careful to do so. The fish is salted and smoked so slightly that it tastes very sweet and pleasant, and is very toothsome and popular. Fully two hundred persons are known to have been made sick by it, the sickness commencing only about twenty-four hours after its ingestion, in some cases with only slight malaise, but in others with nausea and vomiting ; severe pains in abdomen ; diarrhœa profuse, watery, and offensive ; severe pains in back and head ; soreness in all the muscles, even in those of eyeball ; severe prostration ; total loss of digestive power and insomnia resulted, with a sharp and considerable rise of temperature. In some cases delirium ensued ; in others, cramps of muscles of extremities. A great many cases were prostrated so as to be unable to leave the bed, and had not fully recovered after several weeks.

Some of the pieces of fish were thin and pretty well cured, and parties who happened to eat of these pieces only had malaise or other slight sickness. Other pieces of the meat were thicker, and neither salt nor smoke had penetrated ;

those eating this manifested the most severe symptoms. In one family the meat was cooked and not one was sickened, although they ate heartily of it.

The microscope showed a specimen examined on June 10th to be swarming with the vibriones of decomposition. Bacteria were numerous in it. Dr. Mosse says: "My idea is that the meat was eaten in the first stage of decomposition, the resulting ptomaines causing the irritation of the digestive tract. . . .

"I am of the opinion that the manufacturers are at fault, and ought to be prohibited from curing it in this manner, and ought to be prosecuted in the interest of the people; although I must say this much in their favor, that they did not represent that the meat would keep more than a week or ten days, but notified the retailers of this fact, the latter being at fault in supplying such flesh to consumers, and withholding from the latter such necessary information concerning it.

"I should like to see its manufacture prohibited; or, if it is healthy food when properly cured, the manufacturers ought to cure it properly, or suffer penalty of prosecution and its results."

*St. Paul* reports for the month of August 192 deaths in a population estimated at 150,000, of which 117 were under five years of age, representing an annual death-rate of 15.09 per 1000. From zymotic diseases there were 87 deaths, and from consumption, 16.

MISSOURI.—*St. Louis*: For the month of August, 1887, 883 deaths, of which 404 were under five years of age, representing an annual death-rate of 25.23 per 1000. From zymotic diseases there were 294 deaths, and from consumption, 68.

*Annual Report* for fiscal year ending April 11th, 1887: Total deaths reported from all causes during the year ending December 31st, 1886, 8268; under five years of age, 3434; death-rate (on estimated population of 400,000), 20.67—2371, or 28.6 per cent, were from zymotic diseases: Diphtheria and croup, 879; scarlet-fever, 149; typhoid-fever, 124; other fevers (excluding 61 from puerperal-fever), 279; diarrhœal diseases, 431; inanition, 206; other zymotic diseases, 243,

and from consumption, 915, or 11 + per cent of the total. As compared with the previous year, there was an increase in the number of deaths from zymotic diseases—chiefly from diphtheria and croup—of 472. And with regard to it, the commissioner continues to find difficulty in enforcing isolation of the sick and private funerals, so difficult is it to impress upon the people the contagiousness of this disease. The Hospital, Asylum, and Poor-House reports continue to show a criminal inadequacy of room, despite the repeated urgency of the respective superintendents. Considering the circumstances, the results are suprisingly good.

NEW JERSEY.—*Newark* reports for the year 1886 mortality statistics complete, births and marriages unsatisfactory. Total number of deaths, 3602, in a population estimated at 160,319; death-rate per 1000, 22.51. Of the total number, 1447, or 40.1 per cent, were of children under five years. From zymotic diseases the number of deaths was 693; croup and diphtheria, 250; diarrhœal diseases, 195; typhoid-fever, 77; whooping-cough, 28; malarial-fever, 25; scarlet-fever, 18; measles, 6, and other zymotic diseases, 89. From consumption, 473—13 per cent of total. The chief subjects demanding the attention of the Board during the year have been privy vaults and cesspools, disposal of night-soil, "sunken lots," with their concomitants, stagnant water and filthy soil, and tenement-houses. The water-supply from the Passaic River is of increasing impurity, in proportion with the increase of the amount of sewage discharged into it above the intake, and measurably accounts for the large proportion of deaths from filth diseases, particularly of typhoid-fever. The slaughter houses are also too numerous—eight—badly constructed, and without proper provision for drainage. The health officer is evidently very earnest in his work, and urges upon the city authorities the necessity of removing these sources of constantly prevailing diseases in the community at the earliest practical period.

For the month of August 385 deaths in a population estimated at 164,650, of which 203 were under five years of age, representing an annual death-rate of 28.0 per 1000. From zymotic diseases there were 128 deaths, and from consumption, 43.



*Hudson County* reports for the month of August 594 deaths in a population estimated at 258,434, of which 310 were under five years of age, representing an annual death-rate of 27.3 per 1000. From zymotic diseases there were 153 deaths, and from consumption, 53.

NEW YORK.—The State Board *Bulletin* reports the total mortality of 128 cities and towns, comprising a population of a little upward of 3,500,000 inhabitants, during the month of August, 9,042—nearly 2500 less than during the preceding month. The percentage of deaths under five years is 45.3. From zymotic diseases there were 2950 deaths, or 383.30 per 1000 total mortality. Of these 238.70 per 1000 total mortality were from diarrhœal diseases; 21.46 from typhoid-fever; 33.42 from diphtheria. From small-pox 4 deaths occurred in New York and 2 in the Kings County Hospital; an outbreak of the disease appeared in Edgewater, 11 cases being reported toward the close of the month, up to the issue of this bulletin. The appearance at quarantine in the port of New York, on September 23d, of cholera, from Naples, will cause local Boards of Health to be more scrupulous regarding cleanliness, although there is no immediate prospect of the disease securing a foothold here. From consumption the death-rate per 1000 is 102.80, and 188.60 per 1000 above five years of age. The combined death-ratio from consumption, zymotic, and puerperal diseases is 438.00.

*New York City*, 1,481,920: Deaths for the month, 3280; under five years, 1604; of zymotic diseases per 1000 from all causes, 315.54; diarrhœal diseases, 752; croup and diphtheria, 125; typhoid-fever, 51; measles, 6; malarial diseases, 36; whooping-cough, 24; small-pox, 4; consumption, 396; acute respiratory diseases, 216. Death-rate, 26.06. Percentage of deaths under five years to total deaths, 48.9.

*Brooklyn*, 757,755: Deaths, 1537; under five years, 841; of zymotic diseases per 1000 from all causes, 323.35; from diarrhœal diseases, 373; croup and diphtheria, 70; typhoid-fever, 20; malarial diseases, 18; whooping-cough, 5; scarlet-fever, 9; consumption, 147; acute respiratory diseases, 96. Death-rate, 23.88. Percentage of deaths under five years to total deaths, 54.7.



*Buffalo*, 202,818 : Deaths for four weeks ending August 27th, 489 ; under five years of age, 328 ; from zymotic diseases per 1000 from all causes, 438 ; croup and diphtheria, 9 ; consumption, 30 ; acute respiratory diseases, 15. Death-rate, 31.34. Percentage of deaths under five years to total deaths, 67.1.

*Rochester*, 110,000, month of August : Deaths, 166 ; under five years, 68 ; of zymotic diseases per 1000 from all causes, 253 ; from diarrhœal diseases, 29 ; croup and diphtheria, 7 ; consumption, 19 ; acute respiratory diseases, 11. Death-rate, 18. Percentage of deaths under five years to total deaths, 40.03.

*Syracuse*.—Dr. John Vanduyn, health officer, reports for the year 1886 total number of deaths 1059—annual rate, 15.57 per 1000 (78,000)—298 were of children under five years, 157, or 14.8 per cent only, were caused by zymotic diseases—an unusually small ratio as compared with other cities of the State. Of these, diarrhœal diseases caused 78 ; typhoid-fever, 24 ; diphtheria, 18 ; malarial-fever, 10 ; other zymotic diseases, 1–6, 27. Of the infantile mortality, 217 died under one year of age, and 80 of these during the months of July and August. The rest were about equally distributed throughout the year, showing a cause operative independently of the heat of summer. The deaths from diphtheria were also quite evenly distributed throughout the year. From typhoid-fever, one half occurred during August, September, and October. But “ the deaths give only an approximate idea of the distribution of these diseases ” (typhoid and malarial fevers). Hence the health officer recommends that the Board of Health insist upon obligatory reports of these diseases.

The sewerage is reported to be in a crude state, subject to constant retention of sewage in a state of putrefaction ; cess-pools and privy vaults are still numerous and foul, and there are yet many wells—not one of which that is not probably polluted with sewage—still in use for drinking-water, promoting sickness and increasing the death-rate, despite the utmost efforts of the health service. The food-supply has also required much attention. Besides unwholesome meat and milk, constantly looked after by special officers, *spices* and *baking powders*, sold by the grocers, have been found to be especially

subject to adulterations injurious to health. The schools have been found overcrowded, and some of them otherwise dangerous to the health of children, in consequence of defective drainage, plumbing, heating, and ventilation. The Board of Health is evidently earnest and industrious, by no means content with relative good results, but rightly interpreting them as incentives to better.

*Lowest death-rates* : The five cities of 10,000 inhabitants and upward in the State of New York during the month of August were : Hornellsville, 10,000, 7.20 ; Gloversville, 10,000, 12 ; Hempstead, 18,160, 14 ; Elmira, 25,000, 17.30 ; Syracuse, 78,000, 17.54.

*Highest death-rates* : The five cities of 10,000 inhabitants and upward in the State of New York during the month of August were : Saratoga Springs, 10,000, 48 ; Long Island City, 21,000, 44.57 ; Newtown, 10,000, 32.40 ; Jamaica, 10,089, 32 ; Kingston, 21,000, 29.57.

NORTH CAROLINA.—*Bulletin* for the month of August reports from 50 counties, in 25 of which typhoid-fever is reported, but as being prevalent in but 1 ; malarial-fever in 14 of the 50 counties, as against 13 of 43 counties during the preceding month ; diarrhoeal diseases reported in 7 counties, but in only one as " bloody flux," and with but few fatal cases ; diphtheria to some extent in 6 counties ; scarlet-fever in but 1, Pender County, but there epidemic. In general, an unusual state of health. Hog-cholera epidemic in Tyrrell, but not reported elsewhere.

*Wilmington* : population—whites, 9900 ; colored, 13,500—23,400. Death-rates : white, 11.0 ; colored, 24.0 : 23.4.

*Charlotte* : population—white, 6000 ; colored, 5000—11,000. Death-rates : white, 10.0 ; colored, 33.6 : 20.7.

*Asheville* : population—white, 4641 ; colored, 2607—7248. Death-rates : white, 15.5 ; colored, 9.2 : 13.2.

*Durham* : population—white, 4500 ; colored, 2500—7000. Death-rates : white, 16.0 ; colored, 28.8 : 20.6.

*Fayetteville* : population—white, 2500 ; colored, 1800—4300. Death-rates : white, 28.8 ; colored, 33.3 : 30.7.

*Raleigh* : population—white, 8000 ; colored, 7000—15,000. Death-rates : white, 19.5 ; colored, 24.0 : 21.6.

OHIO Weekly *Bulletin* for the four weeks ending August 26th, 1887, reports cases of measles, 24; diphtheria, 74; scarlet-fever, 36; whooping-cough, 95; typhoid-fever, 73; typho-malarial-fever, 118; cholera infantum, 270; and other diarrhœal diseases, 1589. The Board has issued a circular urging the attention of all local boards to the

“Three essential factors to the prevalence of cholera in this country as an epidemic: (1) Importation of the disease by means of ships. . . . (2) Local unsanitary conditions favorable to the reception and development of the disease. (3) Persons sick with the disease in some of its stages, or things infected by such sick persons, to carry it from place to place.

“ . . . The history of former invasions shows that it has sometimes been carried by immigrants past our quarantine stations to points far inland, where the germs of the disease have been liberated by the unpacking of clothes or household goods. The epidemic in this country in 1873 furnishes an example of this kind, and Ohio was one of the States into which it was so introduced. Passengers arrived here in perfect health; some of them reached Carthage, O., where their goods were unpacked. Within twenty-four hours after the poisonous particles were liberated, the first cases of the disease appeared, and the unfortunates were almost literally swept from the face of the earth.”

*Cincinnati* reports for the month of August 625 deaths in a population estimated at 325,000, of which 320 were under five years of age, representing an annual death-rate of 33.07 per 1000. From zymotic diseases there were 180 deaths, and from consumption, 64.

*Toledo* reports for the year 1886 the total number of deaths 933—12.89 per 1000—the lowest rate the city has ever attained. The good results are measurably attributed to a relatively pure milk supply and exemption from tenement-house crowding. Yet the deaths of children under five years of age numbered 358—not a particularly good showing, and suggestive of “still room for improvement.” The summer diseases of children are said to have been less prevalent than usual. Diphtheria and scarlet-fever were reported every month throughout the year, of the former, 175 cases, 34 deaths; and of the latter, 210 cases, with 12 deaths; this is

regarded as a good showing for the year, because an improvement on the past. There were also 41 deaths from croup, 9 from typhoid-fever, and 11 from malarial-fever. From consumption, 128—13.7 per cent of total from all causes.

PENNSYLVANIA. *Obituary*: A special meeting of the State Board of Health was held on Thursday, September 1st, 1887, at the Executive Office, No. 1532 Pine Street, Philadelphia, to take action in reference to the death of late President of the board, Dr. Edward William Germer, of Erie, when the following resolutions were adopted :

*Resolved*, That this board has heard with profound regret of the decease of its valued fellow-member and late President, Dr. Edward William Germer.

*Resolved*, That in a thorough and intelligent understanding of the principles of State hygiene, learned at the feet of Europe's earliest teacher in this most important branch of medical science, he had few equals; and in untiring energy, courage, and self-devotion in their practical applications in times of public danger, no superior.

*Resolved*, That while the board in its official capacity has lost an able, wise, and faithful member, whose whole energies were devoted to the good of the people, as individuals we mourn the departure of one whose endearing social qualities and warm emotional nature made him a delightful companion and a true friend.

*Resolved*, That copies of these resolutions be forwarded to the daily and medical press, and that a copy be sent to the bereaved family.

*Philadelphia* reports for four weeks ending August 27th, 1849 deaths in a population estimated at 993,801, of which 904 were under five years of age. Death-rate, 24.1 per 1000. From zymotic diseases there were 481 deaths, and from consumption, 180.

*Pittsburgh* reports for four weeks ending August 27th, 397 deaths in a population estimated at 210,000, of which 192 were under five years of age. Death-rate, 24.5 per 1000. From zymotic diseases there were 57 deaths, and from consumption, 38.

RHODE ISLAND.—Ninth Annual Report of the State Board



of Health for the year ending December 31st, 1886, including the Report upon Births, Marriages, and Deaths in 1885, pp. 370. Omitting the details, the Secretary and Executive Officer of the Board and State Registrar of Vital Statistics, Dr. Charles H. Fisher, expresses satisfaction that the State was unusually free from epidemics during the year 1886, and that while miasmatic diseases were quite prevalent in a few towns, they were unattended with large fatality. To what extent the general exemption from zymotic diseases for the year was due to the increased attention paid to sanitation, the Secretary makes no attempt to estimate ; but a glance at the reports of medical correspondents and town clerks (clerks of the boards of health) shows a gratifying progress in practical sanitation throughout the State. Yet there is great room for improvement, particularly with regard to the general apathy which prevails among the civil authorities until absolutely brought face to face with prevailing disease—an apathy by no means limited to Rhode Island. This is well illustrated, however, by the efforts of the Newport Sanitary Protection Association. This association was organized about eight years ago by a few public-spirited physicians and other citizens who had a clear appreciation of the fact that no place in the United States depends more upon its reputation as a sanitary resort than Newport. And while the beneficent purposes and efforts of this association have won the recognition and praise of intelligent people all over the country, the headway it has made from the outset has been against the stint of ignorant or purblind civil authorities ; and the people, with few exceptions, appear to be well-nigh as apathetic as—indeed they are generally pretty well represented by—their chosen authorities. After eight years' persistent work, the association now reports : " If any one still doubts that there is abundant opportunity and need for sanitary work of all kinds in Newport, an inspection of the district in the neighborhood of the gas works, which will serve as an illustration of many other sections, will quickly convince him of the fact." The system of sewerage, which was undertaken chiefly in consequence of the pressure of this Association five years ago, as reported, has been constantly subject to alterations, nuisances, and delays, and a foul water-supply still obtains. In short, there is a combina-

tion of unsanitary conditions and procrastinating civil authorities of such a character as to be certain, ere long, unless it is broken, to realize the apparently coveted epidemic and decadence of Newport's good name as a sanitary resort.

*Water-supply* is the subject of a special contribution by J. P. Cotton, C.E., of Newport. After some general remarks on the importance of the subject, defining "wholesome," "suspicious," and "dangerous" waters—the two latter heads being those upon which Newport's reliance has hitherto been placed—"stored rain water and surface water from cultivated land," and "river water to which sewage gains access, and shallow well water." These conditions are elaborated, and their relations, generally, made so clear that civil authorities, whose duty it is to profit by them, should be prosecuted if they neglect to do so.

*Travels of Intermittent-fever in Rhode Island*, by Franklin C. Clark, A.M., M.D., of Providence, is a particularly interesting historical sketch of the theories of that disease which have from time to time prevailed, and his practical conclusion is that "the early and present settlement of new States and Territories all point to *drainage as the surest means by which we may be able to extinguish what is known as malarial-fever.*"

*The Anticipatory Treatment of Local Epidemics*, extracts from a paper read before the Rhode Island Medical Society, by Horatio R. Storer, A.M., M.D., of Newport, is an apt application of close observation of the conditions which give rise to and promote the spread of epidemic diseases, and what should be required of the State and civil authorities generally for the protection of the people. Several citations are made of long-neglected palpable conditions, until their legitimate fruits in devastating epidemics have occurred, *after which* only the civil authorities, though long before cognizant of them, are roused to a sense of their duty! As a matter of history, a note is appended to Dr. Storer's essay, which states the society before which it was read appointed a committee to memorialize the State Assembly for a special appropriation to enable the State Board of Health to more effectually suppress local epidemics.

The Registration Report sums up for six years as follows:

	1880	1881.	1882.	1883.	1884.	1885.
Birth-rates.....	22.8	24.4	24.7	24.4	23.9	23.1
Death-rates.....	17.5	18.1	18.3	18.1	17.1	17.7
Excess of births over deaths...	5.3	6.3	6.4	6.3	6.8	5.4
Marriage rates.....	20.0	19.8	19.1	18.5	17.2	16.3

It is observed that while the birth-rate has fluctuated somewhat, the variations have been small in degree—less than 2 per 1000 of the population for the whole period. The extremes in the death-rates have been still less—1.2 in every 1000. But the diminution of the marriage rates are decided and obvious—3.7 between 1880 and 1885, nearly 20 per cent. Meanwhile, the population has increased 27,753, or about 10 per cent. The increase by the excess of births over the deaths was 2.8 per cent, leaving 7.2 of the increase, or 20,000 persons additional by immigration.

Total deaths reported from all causes, 5389, of which 781, or 14.49 per cent, were caused by consumption—1.42 per cent less than the average for the last preceding twenty-five years. From zymotic diseases, 1036—19.23 per cent; of these the most prolific were typhoid-fever, 104; diphtheria and croup, 193; diarrhoeal diseases, 120; typhoid-fever, 104; scarlet-fever, 91; measles, 45; whooping-cough, 42; malarial-fever, 33.

Divorces granted during the year 1885, 227—1 to every 11 marriages—smaller than during any year since 1878, when it was 1 in 11.9. During the ten years 1869 to 1878, inclusive, the ratio was 1 divorce to every 13 marriages; 1879 to 1884, inclusive, 1 to every 9.10.

*Providence* annual report of births, marriages, and deaths for the year 1886. Population, 120,000: births, 2960—24.67 per 1000; persons married, 2498—20.82 per 1000; deaths, 2355—19.62 per 1000.

A summary for thirty-one years shows the percentage of births of American, foreign, and mixed parentage, with an average as follows:

American, 40.22; foreign, 45.61; American father and foreign mother, 6.31; foreign father and American mother, 7.86. There were two mothers in 1886, aged fifty years, one of whom bore her eighth, another her eleventh child in that year. There were 795 cases of twins, 9 cases of triplets, and 1 of

quadruplets. Of the marriages, 76, or 6.08 per cent, were of persons where one or both persons had been divorced : one in 16.4 of all the marriages during the year.

The rate of mortality in 1886, 20.82, was very nearly the same as the average for thirty-one years—19.58 per 1000. The largest monthly mortality was 268, in August ; the smallest, 156, in November. Quarterly : the largest number of deaths occurred in the third quarter, and the smallest in the second—in accordance with the general rule in Providence. Percentages of deaths at different ages : under one year, 19.23 ; one and two, 7.98 ; two and five, 8.63—total under five, 35.84. Number and percentage from special causes : consumption, 368—15.66 per cent ; pneumonia, 184—7.83 per cent ; heart diseases, 164—6.98 per cent ; diphtheria, 98—4.17 per cent ; old age, 75—3.19 per cent ; typhoid-fever, 53—2.25 per cent.

Reports for the *month of July*, 1887, 232 deaths, population estimated at 121,500, of which 101 were under five years of age, and representing an annual death-rate of 22.91 per 1000. From zymotic diseases there were 87 deaths, diarrhœal diseases, 62, and from consumption, 16.

*Newport* Board of Health reports for the year 1886 total mortality (exclusive of 32 still-born), 314, of which 60, or 19.1 per cent, were from zymotic diseases, 40, or 12.4 per cent, from consumption. The number of cases of infectious diseases reported during the year was 70—more than twice as great as during the preceding year (32)—and chiefly of those known to be pre-eminently due to filth : Diphtheria, 38 ; typhoid-fever, 21. The rest were of scarlet-fever, 10 ; cerebro-spinal meningitis, 1. “Sunken lots,” swill, and garbage dumping-grounds, the slow progress of sewerage and filth storage, meanwhile, and the usual adjunct of these conditions, a foul water-supply, are the concomitants.

TENNESSEE.—The prevailing diseases named in the order of their prevalence in the State for the month of August were malarial-fever, dysentery, pneumonia, diarrhœa, cholera infantum, cholera morbus, consumption, catarrhal-fever, rheumatism, and croup.

Typhoid-fever is reported in the counties of Cannon, Chester, Davidson, Hamilton, Hawkins, Jackson, Jefferson, Knox,



Lewis, Madison, McMinn, Moore, Overton, Pickett, Putnam, Rutherford, Shelby, Williamson, and Wilson.

Whooping-cough in Cannon, Davidson, De Kalb, Hamilton, Hardin, James, Maury, Montgomery, Moore, Putnam, and Rhea.

Diphtheria in Hamilton, Hardin, Hawkins, Jefferson, Knox, Madison, and Shelby.

Scarlet-fever in Coffee, Davidson, Knox, and Shelby.

Measles in Hamilton, Lewis, and Pickett.

Mumps in Moore.

Spinal meningitis in Sullivan.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga, white,	11.00 ;	colored,	36.92 : 20.10
Clarksville,	9.60 ;	"	36.00 : 19.50
Columbia,	15.05 ;	"	25.81 : 19.76
Knoxville,	14.68 ;	"	20.50 : 15.88
Memphis,	18.20 ;	"	38.50 : 25.41
Nashville,	13.47 ;	"	23.69 : 17.12

The mean temperature was  $76.7^{\circ}$ , the highest August mean during the five years. The highest temperature was  $103^{\circ}$ , recorded on the 3d, at Austin, Wilson County ; and the next highest was  $102^{\circ}$ , recorded on the 3d, 12th, and 14th, at Milan, Gibson County. The maximum,  $101^{\circ}$ , was recorded at Riddleton, Smith County, on the 15th, at Savannah, Hardin County, on the 2d, and at Hohenwald, Lewis County, on the 2d, 3d, and 5th. The lowest temperature was  $48^{\circ}$ , recorded on the 25th, 29th, and 31st. The monthly range of temperature was slightly in excess of the normal, as was also the mean daily range. During the last decade a period of low temperature prevailed.

The mean precipitation was 3.07 inches, which was about an inch less than the August mean of last year, and about that amount more than the August means of the two preceding years.

VIRGINIA.—*Richmond* reports for the month of August 178 deaths in a population estimated at 100,000, of which 67 were under five years of age, representing an annual death-rate of 21.36 per 1000. From zymotic diseases there were 51 deaths, and from consumption, 18.

WISCONSIN.—The State Board of Health report for 1886 opens with a brief general report and a detail by the Secretary of a good deal of excellent work by the board during the year in stamping out several local epidemics of typhoid-fever, diphtheria, scarlet-fever, measles, and whooping-cough ; and the promptitude with which several outbreaks of small-pox were estopped by quarantine and vaccination. There are besides reports of special investigations on Coloring Candies, Typhoid-Fever Epidemic at Waterford, Sewerage as Recently Constructed at Green Bay, Conditions of Health in Cities, School Sanitation, School Furniture, Heredity and Hydrophobia, to which is appended extracts from correspondence. The Secretary's account of the Typhoid-Fever Epidemic at Waterford is a cogent rehearsal of an oft-repeated lesson : Firstly, filth storage in cesspools and privy vaults, or filth out-throw on the surface of the ground, without regard to the close proximity of wells and pumps, conveniently situated for its reception and subsequent ingestion with the drinking water ; secondly, the total neglect of disinfecting the discharges from the bowels of those who were affected with the disease ; and thirdly, that the health service in Wisconsin, as generally throughout the country, discovers and elaborates these results of patent conditions promotive of disease, which it should be the chief duty of the health service everywhere to discover and have corrected *before* any such results ensue. But it is the misfortune that while much more might be done than is in this regard, our health laws generally are woefully lacking in mandatory power ; they permit people to poison themselves and blame the health authorities for not interfering with the exercise of their private rights to poison themselves and their neighbors ! The Conditions of Health in Cities also cites an illustration of the same privilege by the public authorities in Milwaukee, under indictment at the time the report before us was made for allowing an open sewer to discharge into the lake whence the drinking water is supplied. The papers on School Sanitation and Furniture expose common evils and suggest good remedies, but so long as the Board of Health is not empowered to apply them, the people, generally, and school-teachers in particular, will continue to stunt and deform school children despite such wholesome literature. The paper on Heredity is in some respects illogical and over-

wrought, particularly with regard to the influence of inter-marriage of near relatives, the Jews being a standing contradiction to the common belief; and intemperance, without making sufficient allowance for the environment. But, on the whole, it contains a good deal of useful information well calculated to promote the health of the people.

*Milwaukee* reports for the month of August 1384 deaths in a population estimated at 760,000, of which 739 were under five years of age, representing an annual death-rate of 21.8 per 1000. From zymotic diseases there were 495 deaths, and from consumption, 125.

CHOLERA reports received through Surgeon-General Hamilton's abstracts and other sources August 15th to October 15th, as follows:

*Palermo*: United States Consul reports 395 cases, 239 deaths. "Under date of September 26th, the Consul reports that there were 54 cases and 24 deaths during the seven days, ending on the 25th inst., the same being an increase of 6 cases and a diminution of 11 deaths compared with the preceding week."

*Naples*: September 3d to 27th, 214 cases, 145 deaths. Under date of September 14th, Consul reports: "The entire country surrounding Naples is quite infected with cholera, but it is impossible to ascertain the exact truth, as the authorities are very reticent in regard to the actual state of affairs."

*Rome*: August 25th to September 8th, 109 cases, 56 deaths. Also in Tivoli and various villages of the province. "The precise number of cases is not obtainable, but the mortality is said to be about 60 per cent." The Consul in his despatch under date of September 26th states that "cholera has prevailed in certain parts of Sicily since the early spring. With the beginning of summer the disease appeared at some southern places on the mainland, also in the environs of Naples, and finally in that city early in August. Up to the present time neither the government nor other authorities give any information, statements, or bulletins concerning it, with the exception of in Sicily, from whence the associated press of Italy, under government surveillance, telegraphs daily showings for the chief cities of Sicily. Besides these chief cities—Palermo, Messina, and Catania—I have the best reasons for



believing that many scattered cases of cholera are now occurring daily, not only in Sicily, but in many ports and places in the southern and central portions of the mainland, notably south of a line drawn from the Mediterranean opposite Rome across to Ancona, on the Adriatic. . . . Vessels communicate freely between the infected and non-infected ports of the kingdom. As concerns the United States, besides sailing-vessels, there are at present three separate lines of steamers running between Palermo and Naples and New York. These steamers, as a rule, make the round of the chief ports of Sicily—say Messina, Catania, and Palermo—then proceed to Naples, whence they depart for the United States. In addition to cargo, nearly all carry emigrants or third-class passengers, recruited in Sicily and in southern parts of the mainland.”

The Consul-General, in despatch under date of October 10th, 1887, states that the Vice-Consul-General has just succeeded in obtaining from an official source the following facts in regard to the cholera in that city :

“From August 16th, 1887, to October 7th, included, there were buried in the cemeteries of this city 204 bodies of persons certified in a special official register to have died of Asiatic cholera.

“As the ordinary portion of deaths in cases of cholera in Italy during the last four years has been a little less than 50 per cent, it may be safely assumed that there have been in Rome, between August 16th and October 7th, more than 400 cases of cholera. There has been at no time more than 10 burials in consequence of deaths by cholera during any one day since August 16th, and during the week ending October 7th, the average number of such burials was less than 2 per day. On October 6th and 7th there was one such burial on each day. There were on October 7th 10 cholera patients in the lazaretto, and 30 persons detained under surveillance in the house of observation. At one time in August or September there were nearly 300 persons so detained.”

*Florence* : The United States Consul, in his despatch dated October 4th, 1887, states that “while the authorities do their utmost to keep secret all cases of cholera occurring there, and the health officer continues to grant clean bills of health to vessels leaving that port, cases of cholera are being daily declared by the municipal doctors.”



*Messina* : United States Consul, under date of September 12th, reports cholera epidemic. “. . . The movement of foreign shipping has been small this summer. Up to the 10th instant the port authorities continued to give clean bills of health. The record of cases and of deaths from cholera in the province of Messina from July 4th to September 8th is 71 cases and 45 deaths, of which 55 cases and 34 deaths occurred in the city of Messina. From August 28th to September 8th but 2 cases of cholera have occurred ; the sanitary precautions were suspended, and, confidence being restored, thousands of refugees returned to the city for the municipal election, September 8th. Cholera reappeared in an aggravated form on the 10th instant. From Saturday morning to Monday midnight 158 cases and 66 deaths have been reported.”

*Marseilles* : Consul reports, under date of September 10th, 5 deaths only from cholera during the year to that date : 1 in July, 1 in August, and 3 in September.

*Malta* : Consul reports from August 22d to September 12th, 144 cases, 64 deaths.

*Ning Po*, China, under date of September 7th, Consul reports 200 deaths from cholera daily.

*Calcutta* : Deaths reported from cholera during the five weeks ending August 13th, 77.

*New York Quarantine Station* : The U. S. Consul at Marseilles, in his despatch under date of October 6th, 1887, relative to the arrival of the steamer *Alesia* at New York, on the 23d of September, with several cases of cholera on board, and to the American newspaper reports that the disease was brought from Marseilles, states that “the *Alesia* left this port (Marseilles) on the 30th of August last in perfect sanitary condition, and without a single passenger of any class on board. All the emigrants and other passengers among whom the cholera broke out during the voyage to New York were taken on board at Naples, where the steamer arrived on the 1st of September. The cholera now at the quarantine station in New York Bay is an offshoot from the epidemic which is raging in Sicily, and more or less generally throughout southern Italy.”

At the time of this writing such energetic measures are in progress at the New York quarantine establishment as may be safely predicted to be effectual in completely arresting the

cholera at that place for the present, and in satisfying the public that there is no danger of its introduction by the Alesia's passengers. The condition of the quarantine establishment, the measures instituted for destroying the infection in this instance, and the needs of the establishment will form the subject of an editorial in next number.

SMALL-POX continues to exist in New York and Brooklyn, or, at least, to repeatedly crop out, probably in consequence of infected clothing of recently-arrived emigrants. But considering that every case is promptly isolated, and that it is a continuous spur to vaccination, the public hereabouts has more to hope than to fear from its existence under recent restrictions. *Abroad* it is unusually prevalent in cities in commercial intercourse with the United States, and with the port of New York in particular, and requires the utmost vigilance with regard to fomites of all kinds to prevent its dissemination. By reports received September 15th to October 17th, deaths reported from small-pox as follows: Sheffield, September 3d to October 1st, 29; Liverpool, September 11th-17th, 1; Bristol, September 10th to October 1st, 2; Paris, August 28th to October 1st, 31; Marseilles, month of July, 4; Havre, August 28th to September 10th, 8; Nice, July 16th to August 31st, 11; Milan, month of July, 43; Rome, July 3d-30th, 19; Genoa, August 1st to October 1st, 14; Bologna, month of July, 6; Saragossa, July and August, 21; Lisbon, August 7th to September 10th, 25; Vienna, August 22d to September 3d, 3; Prague, August 22d to September 17th, 9; Trieste, August 28th to October 1st, 52; Presburg, August 14th to September 17th, 6; Pesthe, August 28th to September 24th, 6; Brunn, August 14th-20th, 1; Turin, August 11th-20th, 1; Bucharest, September 18th to October 1st, 5; St. Petersburg, August 21st to September 24th, 19; Warsaw, August 22d to September 24th, 82; Cairo, August 12th-18th, 3; Buenos Ayres, July and August, 516; Rio de Janeiro, week ending September 10th, 143; Havana, month of September, 246, three weeks ending October 15th, 196; Santiago de Cuba, where small-pox has been very prevalent recently, "the sanitary inspector reports for the week ended October 8th, 1887, that small-pox has almost disappeared, only 4 cases and no deaths having been recorded for the week.

(Yellow-fever still continues to rage among the troops at the military hospital outside the city limits. Twenty-six cases and 10 deaths have been reported during the week.") Cienfuegos, three weeks ending October 17th, 11; Guayaquil, August 28th to September 29th, 23; Martinique, reported September 21st, but number of cases not given.

YELLOW-FEVER.—Summed up from the Weekly Abstract of Sanitary Reports of Surgeon-General Hamilton, September 22d to October 28th, cases and deaths of yellow-fever reported in

*Key West, Fla.*: Week ending Sept. 22d, new cases, 0; deaths, 1  
 " " 28th, " 2; " 1

" Dr. J. Y. Porter, President of the Board of Health, reports by telegraph, under date of October 6th, that 3 cases have been reported since September 30th at the village of Progreso, two miles from the city, making for the month of September 6 cases and 1 death. None since. The epidemic is over."

" *Tampa, Fla.*: October 7th, 20 cases and 4 deaths from yellow-fever were reported. A panic prevails in the city." October 13th, 40 cases and 8 deaths reported to date. October 21st, " Deputy-Collector Spencer reports, from best data, 150 cases reported, 25 deaths. 2 deaths, 5 new cases since report." October 26th, Dr. J. Y. Porter, United States Quarantine Inspector, reports a total to date, 225 cases, 34 deaths. Fourteen new cases since the previous day, and about 80 at that time sick.

*Havana*: During the month of September, 41 deaths; number of cases not reported.

*Santiago de Cuba* (Abstract of October 6th): Total number of deaths from yellow-fever during the last three months, 273; and the number of cases, 365—a majority of whom were unacclimated recruits. The disease has been almost wholly confined to the military hospital. The shipping has been entirely free.

*Cienfuegos*: September 12th to October 17th, 14 deaths reported—8 of which occurred during the two weeks ending October 17th.

*Livingston*, Central America, under date of August 27th, several cases" had been reported.

*Merida*: During week ending September 29th, 1 death.

*Maracaibo*: August 20th, 1 death.

*Vera Cruz*: October 13th, 1 death.

LITERARY NOTICES.

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COAST CLIMATE OF CALIFORNIA. ALSO THE USE AND ABUSE OF THE MINERAL SPRINGS OF CALIFORNIA, By JOHN W. ROBERTSON, M.D., Crescent City, Del Norte County. Reprinted from the Ninth Report of California State Board of Health, 1886. The annual temperature of the coast is said to range from 45° to 60° F., and the rainfall (Signal Service Station, Crescent City), 1883-84, 69.56; 1884-85, 71.71; 1885-86, 105.28. Number of rainy days for the same periods respectively, 82, 79, 102. The rainfall is almost wholly confined to the months October to April. "The ocean breezes are possessed by a peculiar 'freshness' that sends unpleasant chills through the new-comer, unless he be unusually vigorous. A few weeks' residence changes this rawness into an agreeable state of invigoration, and there is a sense of buoyancy and vitality experienced in no other climate. The therapeutical effect of the climate is essentially tonic, and suited only to certain classes of invalids."

Uncertainty with regard to the use of the mineral springs is attributed to the general ignorance of their therapeutical adaptations among physicians as well as other people throughout the State. While many have been analyzed, the analyses are for the most part unreliable. Nevertheless, they are summarized, and practical information of much value given.

A MANUAL OF THE PHYSICAL DIAGNOSIS OF THORACIC DISEASES. By E. DARWIN HUDSON, Jr., A.M., M.D., late Professor of General Medicine and Diseases of the Chest in the New York Polyclinic; Physician to Bellevue Hospital, etc. 8vo, pp. 162. Nearly 100 illustrations. Muslin. Price, \$1.50. New York: William Wood & Co.

No subject is of more importance to medical practitioners than that of which this book treats; and, presumably, no student of medicine nowadays is permitted to receive the degree of M.D. without it; at least, no one is competent to practise medicine without this knowledge, and we know of no book from which it may be obtained with more facility than from the one before us.



ANNUAL REPORT OF THE SPECIAL COMMITTEE ON SURGERY. An excerpt from the Transactions of the Texas State Medical Association, summarizes 5339 operations, with tabulated details, as reported by the operators.

AFRICA AND THE DRINK TRAFFIC. The National Temperance Society has just published in pamphlet form an article by Archdeacon Farrar, from the *Contemporary Review*, upon the demoralization of the native races of Africa by the drink traffic. The pamphlet also contains W. T. Hornblower's striking letter to the *New York Tribune*, entitled, "Rum on the Congo." The appalling facts given in this pamphlet concerning the terrible havoc caused by strong drink among the natives on the Congo and elsewhere in Africa, should suffice to arouse Christian men and women in our own and in all civilized countries to the importance of prompt and vigorous action. This timely pamphlet should have the widest possible circulation. Price, 10 cents. Address J. N. Stearns, Publishing Agent, 58 Reade Street, New York.

TRANSACTIONS OF THE MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND, 1887. Pp. 152. The President's Address (by George W. Miltenberger, M.D.) pays tribute to preventive medicine by quoting one of the latest utterances of the lamented Flint, that :

"The medical profession will have reached a high ideal position when the physician, guided by his knowledge of diagnosis, the natural history of disease, and existing therapeutic resources, may, with neither self-distrust nor the self-distrust of others, treat acute diseases by hygienic measures without potent medication. When this time comes, a system of practice which assumes to substitute medical dynamics for the *vis medicatrix naturæ* will have been added to the list of bygone medical delusions."

Next following the President's Address is "Modes of Infection ;" the Annual Address, by William H. Welch, M.D., Professor of Pathology, Johns Hopkins University. This is limited, for the most part, to a consideration of the hypothesis that the micro-organisms of miasmatic contagious diseases acquire their contagious property by some unknown metamor-

phosis under favorable circumstances, after they have been expelled from the human body. "Inoculation experiments upon animals with the cholera bacilli lend no support to this assumption," and so of other evidence cited. The address is the result of much experimental knowledge, as well as familiarity with the literature of the subject, and of much practical importance in dealing with this class of infectious diseases. Excepting a brief paper on "Moral Insanity," by A. B. Arnold, M.D., and "A Case of Abnormal Memory," by J. S. Fort, M.D., the rest of the transactions are confined to papers and discussions on medical and surgical practice.

ALATYPES; OR, STENOTYPOGRAPHY: A SYSTEM OF CONDENSED PRINTING, by HENRY H. BROWN, Battle Creek, Mich., is a little pamphlet which describes and advocates the adoption of "a scientific alphabet . . . until a system is perfected which shall not only be phonetic and easily acquired, but shall be capable of giving such condensed expression to the language that its benefits will appeal successfully for public approval, not only in the matter of facile acquisition of the elements of language, but in the matter of compassing with one fifth or less of the present labor, material, and expense, the blessings of cheap libraries and the general diffusion of knowledge." It is plausible, but requires much study.

REPORT OF THE WATER SUPPLY, SEWERAGE, ETC., OF THE CITY OF BELLAIRE, OHIO, by H. J. SHARP, M.D., London, O., from the Annual Report of the Ohio State Board of Health, is a pamphlet of ten pages, with map, which clearly illustrates the practice and danger of dumping garbage and night-soil into or in the neighborhood of water-courses, as in the particular case designated, and urges cremation instead.

THE BUFFALO LITHIA WATERS IN THE TREATMENT OF DISEASES OF THE NERVOUS SYSTEM, by G. HALSTED BOYLAND, M.D., M.A., late Surgeon of the French Army, etc., is a pamphlet reprint of ten pages from the *New York Medical Journal*, which cites several cases of nervous exhaustion which appear to have benefited by the use of the Buffalo Lithia waters.

THE ELEMENTS OF MODERN DOMESTIC MEDICINE. A plain and practical handbook describing simple diseases, their causes, prevention, and safe treatment, the earliest signs that a physician is needed, and the procedure till the doctor arrives in all emergencies. By HENRY C. MANCHETT, M.D., Member of the New York County Medical Society, late Physician to the New York Homœopathic College Dispensary, and to the Wilson Mission Out-patients' Department, formerly Professor of the Martha Washington College, Virginia, author of "Sexual Health," and of numerous essays and lectures. 12mo, pp. 377. New York : Charles T. Hurlburt. The best commentary on this book is its own preface, *because* "the study of medicine is a serious matter, requiring the unflagging attention of a lifetime ; and the results of such study are not to be condensed into any book for the ready use of any person who may choose to read and apply, without previous study or experience." Yet there are here enumerated over one hundred medicines, including arsenic, mercury, opium, belladonna, hyoscyamus, cantharides, colocynth, and other substances, all requiring care in their administration on the diagnosis of a physician. And following this catalogue of a family *armamentarium medicorum* is a chapter on indications for its use—a catalogue of symptoms with their designated remedies involving the same inconsistency with the paragraph above quoted. In short, it is *not* "a plain and practical handbook, describing simple diseases, their causes, prevention, and safe treatment," but a mischievous temptation to medicine bibbing more likely to cause and promote disease than to prevent it.

"Sexual Health," by the same author and from the same publisher as the foregoing, is a "Companion to Domestic Medicine"—additional chapters—"in order that their use in the family might be determined in each case in accordance with the views of the father or mother," without the risk, apparently, of such literature falling into the hands of persons who are too young or too curious to profit by it. It is, however, professedly a complete work in itself, and, like "Domestic Medicine," contains its own *materia medica*, index of symptoms and remedies, and objectionable features ; nothing of use to the physician which may not be better acquired from medical books intended for physicians exclusively, and for the rest, like the parent volume, mischievous in its tendencies.

PROPHYLAXIS IN RHINITIS SYMPATHETICA, by S. O. RITCHY, M.D., the plain English of which is the *Prevention of Hay-fever*, is a reprint from the *Chicago Medical Journal and Examiner*, giving the author's favorable experience and observation in the home use of flannel undershirts—preferably for summer those commonly designated “French netted goods”—instead of flying to the mountains, where flannel underclothing is required and accomplishes the purpose attributed to the escape from *pollen*.

A PRACTICAL TREATISE ON OBSTETRICS. Vol. IV. Obstetric Operations. The Pathology of the Puerperium. By A. CHARPENTIER, M.D., Paris. Illustrated with lithographic plates and wood-engravings. This is also Vol. IV. of the “Cyclopedia of Obstetrics and Gynecology” (12 vols.), issued monthly during 1887. Price of the set, \$16.50. New York : William Wood & Company. This concluding volume of Charpentier's work is in keeping with the preceding volumes. The operative procedures are fully illustrated with excellent plates and engravings, and the part (viii.) on the pathology of the puerperium gives the most recent advances in the pathology and treatment of puerperal diseases.

WHAT TO DO IN CASES OF POISONING. By WILLIAM MURRELL, M.D., F.R.C.P., Lecturer on Pharmacology and Therapeutics in the Westminster Hospital, etc. Edited by Frank Woodbury, M.D., Fellow of College of Physicians, Philadelphia ; Professor of Materia Medica, Therapeutics, and Clinical Medicine in the Medico-Chirurgical College of Philadelphia, etc. First American from the Fifth English Edition. 12mo, pp. 160. Philadelphia : The Medical Register Company. The American editor has done well for the profession in this country in revising and bringing out this exceedingly useful manual. It contains an alphabetical list of poisons, the symptoms of poisoning, and the most approved formulæ in the treatment—what every physician should know ; and as a facile ready reckoner this is the best manual we know of.

THE INVALID'S VISITOR, Mrs. KATE SUMNER BURR, Editor and Proprietor, Williamson, N. Y., is a monthly of sixteen



pages, 50 cents per annum, published under the auspices of the Invalid's Society, whose object is "To stimulate faith, hope, patience, and courage in fellow-sufferers by the study and presentation of Bible promises."

REPORT ON THE ETIOLOGY OF LEPROSY TO THE CALIFORNIA STATE MEDICAL SOCIETY, by W. F. McNUTT, M.D., M.R.C.P., Edin. Professor of Principles and Practice of Medicine, University of California. The conclusions arrived at are that leprosy is a bacilliary disease, depending upon a special bacillus, the *Bacillus Lepræ*, which is found in all nodules, and in the diffused swellings of the skin in tubercular cases; that the several varieties of leprosy are only different forms of the same disease; that it is both hereditary and contagious; that diet, climate, soil, etc., are not etiological factors, except that they may in common with other unsanitary conditions act as predisposing causes, and that it is an entirely distinct disease from syphilis.

THE RADICAL CURE OF RETRO-DISPLACEMENTS OF THE UTERUS AND PROCIDENTIA BY ALEXANDER'S OPERATION AND MEDIAN CORPORAPHY. By J. H. KELLOGG, M.D., Superintendent Medical and Surgical Sanitarium, Battle Creek, Mich. From Transactions of the Michigan State Medical Society. Report of eleven operations with such uniform success as seemed to justify the conclusion that "if this operation succeeds half as well as present predictions seem to indicate that it will, many thousands of pessary-pestered women will rise up and call great and blessed the fortunate discoverer of this most valuable surgical procedure."

SOME THOUGHTS ON A NEW REMEDIAL SOURCE. By CHARLES FRANCIS RING, M.D., Ward's Island, New York. A heterogeneous essay, chiefly made up of quotations, with the view, apparently, of ascertaining the nature and treatment of chronic diseases in general, but elucidating nothing.

PROFESSOR SHALER'S article on tornadoes and cyclones in *Scribner's Magazine* for August contains reproductions of two instantaneous photographs of a tornado which passed over

Jamestown, Dak., on June 6th, 1887. The publishers had made a special search for negatives of storms, and given notice of it to many Western photographers. This fortunate opportunity occurred after the article was already in type. It is believed that a complete cloud-whirl has not before been photographed ; at all events, thorough inquiry has discovered no instance.

THE DEVELOPMENT OF THE AMERICAN UNIVERSITY, by PROFESSOR GEORGE T. LADD, in *Scribner's Magazine* for September, presents a more thorough discussion of that question than has before appeared, and contains some valuable suggestions as to the improvement of secondary education so as to include the lower years of the college course. Professor Ladd proposes that in the coming university the studies of the upper college classes and those now included in the graduate courses should be embraced.

"HORSFORD'S ACID PHOSPHATE" is a solution of the phosphates of lime, magnesia, potash, and iron, with an excess of phosphoric acid, in such proportions as to render these agents most acceptable to the stomach and most efficacious as a tonic for feeble digestion. It is also particularly serviceable in nervous debility brought about by overwork and worry, and is most efficacious when taken between meals.

YOUNG'S IMPROVED SURGICAL, RECLINING, AND WHEEL CHAIRS (F. E. Young, Canton, O.) are well suited to their purpose. The surgical chair, especially, is automatic in its action, and easily adjusted to all the various positions necessary for examinations of or operations upon the eye, ear, mouth, or throat, in the sitting or other positions ; and equally adaptable to the horizontal position, or any incline, for examinations or operations upon the extremities or pelvic organs, in either Sims' or dorsal position, quickly and noiselessly.

MYER'S SANITARY DEPOT OF PLUMBERS' SUPPLIES, and where plumbing goods of the most recent and best devices may be seen, has removed from Beekman Street to more commodious quarters, 64 and 66 CENTRE STREET, NEW YORK.

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THE AMERICAN PUBLIC HEALTH ASSOCIATION.

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ABSTRACT OF PROCEEDINGS OF FIFTEENTH ANNUAL MEETING, MEMPHIS, TENN., NOVEMBER 8th-11th, 1887.

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THE meeting in Memphis had been looked forward to with so much interest that its reality was somewhat disappointing, both in attendance and the material submitted. The representation from the Gulf and Mississippi Valley States was smaller than it was at the meeting in Toronto the year before. But Memphis itself was such a special subject of interest to a large proportion of those in attendance from distant places as to make full amends for the shortcomings in other respects; and the more to those members who from a practical knowledge of the condition of Memphis at the close of the epidemic of yellow-fever there in 1879 now beheld the evidences of healthful growth in all the surroundings—certainly the most illustrious example in the world of the benefits of practical sanitation. This was made specially manifest in the

WELCOMING ADDRESS of the Hon. J. W. Clapp, at the evening session of the first day's proceedings, who said:

“ . . . When this Association held its annual meeting in Nashville in November, 1879, for two successive years had Memphis been desolated by the dreadful scourge of yellow-fever, and so desperate and hopeless did its condition appear, that in one instance, at least, the heartless and incendiary suggestion was offered that the flames be made to consume what the pestilence had spared, and thus, in one huge holocaust, Memphis, like its prototype upon the Nile, should become a thing of the past. Along with Drs. Porter and

Thornton, whose names, without disparagement to others, are deserving of special mention in connection with the sanitary redemption of Memphis and her present prosperity, I attended the meeting referred to, and after an address from a prominent member of the Association, meant, we will suppose, in kindness, but in which our people were represented as steeped in filth and criminally negligent of the most ordinary precautions, I addressed the Association in vindication and exoneration of our city and its stricken inhabitants, maintaining that we did not occupy the position of culprits or beggars for public charity, but were unfortunate rather than blamable, and that the two gentlemen named, and myself, were in attendance upon the Association with a view to learn the source of the calamities that had befallen us, and how to apply the remedy, and the assurance was given that when this information, of a reliable character, was obtained, prostrated and impoverished as we were, our people were heroic enough, by the help of God, to struggle through our labyrinth of trouble, and our city should be no longer a byword and term of reproach. For the attainment of our object we desired that the Association should appoint, or recommend, a committee competent to investigate our situation and advise us as to the measures of relief proper to be adopted. This request was, with a kindly expression of sympathy, complied with by the Association, and just there was the turning-point in our history.

“And now, Mr. President and gentlemen of the Association, gratefully remembering your considerate feeling and action in the hour of our sorest need, we greet your presence here with unfeigned pleasure, and with warrantable pride and satisfaction invite you to contrast the melancholy wreck of 1879 with the busy, prosperous, and in some respects model city that now joyfully hails you as its honored guests. Then it was upon the verge of bankruptcy and financial ruin; now its indebtedness has all been provided for, and its credit is above par. Then nine miles of decaying wooden pavement filled its streets; now we can exhibit in its stead twenty-five miles of substantial stone and gravel. Then there were within the city limits four miles of private and defective sewerage; now the vaults that perforated our soil have all been filled,



and there are forty-five miles of sewerage unexcelled in quality belonging to the corporation, with corresponding sub-soil drain tiles. Then there were some ten or twelve miles of horse-car street railway ; now there are thirty-five miles of the same kind, and in addition thereto, thirteen miles operated by steam. Then it was the terminus of four lines of trunk railways ; now, the converging point of more than double that number, radiating to every point of the compass, with several others in process of construction, and to accommodate the traffic of these grand arteries of commerce a viaduct across the mighty river that forms our western boundary is an assured event of the early future. Then the value of our annual wholesale and jobbing trade was less than seventy millions of dollars, and the aggregate annual receipts of cotton less than 400,000 bales ; now the same character of trade for the last commercial year aggregates \$160,000,000, and the receipts of cotton were upward of 660,000, and for the current year will be between 700,000 and 1,000,000 bales, constituting Memphis the largest inland cotton market in the world, and third only, if not second, to any Southern seaport. Then, with a population reduced by death and removal to less than 34,000, as appears from the United States census ; now, with a marvellous increase to 75,000. Then, a normal death-rate of 35 per 1000 ; now, of the resident population, 9 per 1000 of the white, and 26 per 1000 of the colored.

“ These remarks might, I am well aware, be deemed out of place and in bad taste before any other audience of strangers than this, but addressing as I do an Association that in a special manner represents the sanitary interests and physical welfare of the whole country and all its parts, it will not, I am sure, be deemed irrelevant or uninteresting to refer with some particularity to so notable an illustration as this city affords of the practical value of sanitary science when its principles are intelligently and earnestly applied. Here is a great and growing city whose vital statistics now challenge comparison with those of any other in the Mississippi Valley, that less than a decade ago was generally regarded as a pestilential hotbed, whose doom was irrevocably fixed and whose very existence was considered as a menace to the general welfare, and surely it cannot fail to interest this enlightened and phil-

anthropic assemblage to learn that this doom was averted, and their city placed upon the highway to prosperity by the indomitable energy and unsparing self-sacrifice of its citizens, who, when overwhelmed with affliction and stunted in the very means of living, expended more than a million of dollars in local sanitation ; and while, with grateful hearts, we recognize the beneficent hand of Him who holds the scales of destiny, yet, if we refer to our trials and our triumphs with something of self-glorification, we feel assured that the weakness will, at least by this Association, be deemed a pardonable one."

HIS EXCELLENCY, GOVERNOR TAYLOR, who followed, also gave a glowing tribute to the objects of the Association and the outcome of its work in Memphis and elsewhere. "If," said he, "I correctly understand the object of your Association, it is the prevention and suppression of disease in the human family. This being true, we regard your honorable body as a marvel of unselfishness and philanthropy. In this you have shown a nobility of character rarely ever exhibited by humanity. Now, the farmer wears a broad smile of triumph and satisfaction and self-complacency when he sees all the crops fail but his own, because he knows he can sell at his own prices. The manufacturer is delighted to see the wares and machinery in use breaking down and going to destruction, and it has been hinted that he often plants in them the seeds of early mortality himself before they leave the shop. For he knows that that means a steady demand for new wares and machinery which he will be called upon to furnish for cash in hand. The merchant rejoices to witness the daily grand procession of patches and rents of threadbare and shabby-genteel raiment, of gaping shoes and seedy hats, because they prophesy for him a ready market for more goods at higher prices. The lawyer shrugs his shoulders in mysterious ecstasy when he beholds his two neighbors quarrelling over an oyster. For he knows that he will ere long get the oyster and leave his neighbors each a half shell. But contrary to the dictates of all this human nature, which seems so universal in man, your noble-hearted Association, composed for the most part of physicians, is seeking to vanish disease from the world and thus cut off our doctor bills. . . .

“The recent history of this beautiful and healthful city of Memphis is a practical demonstration of the correctness of the principles and efficacy of the means which you are seeking to introduce for the prevention of disease and pestilence. The strict observance and application of sanitary principles, the rigid enforcement of measures ensuring cleanliness, the establishment of a splendid system of drainage, have, within a few short years, converted Memphis into one of the healthiest and most delightful cities in the world. . . .

“Organizations like yours, looking to the amelioration of the condition of humanity, like the preservation of health and the consequent promotion of happiness in this world, challenge our profound admiration, sympathy, and gratitude. As a class, I regard the men and women of the medical profession as among the very best citizens of this world. The prime object of all their study and investigation and painstaking and effort from day to day is to heal, to soothe, to assuage the sufferings and miseries of wretched and afflicted humanity, and to make life more tolerable. With the broad shield and the trenchant blade of medical science and skill, the physician is ever standing like a dauntless soldier between us poor mortals and our last great enemy, parrying his thrusts and turning aside his fatal shafts, that we may survive a little longer. He is indeed a soldier and a hero, greater than those who fight on fields of blood. For does he not face the fell destroyer and give him battle on every inch of life's narrow ground? Does he not boldly meet and combat the grim pestilence that walketh in darkness and the destruction that wasteth at noonday? From time immemorial he has stood like a man of iron and fought dreadful enemies, from which whole armies flee in terror and dismay. When duty calls, the honest physician knows no fear. He will not shrink from the awful conflict, but is ever found in the forefront and thickest of the fight.

“When the blessed seals that bind the pestilence are broke,  
And crowded cities wail its stroke,  
How often have we seen him there  
Fight with the courage of despair,  
Nor from the fray one inch would yield  
Till thence was borne upon his shield.”

THE ADDRESS OF THE PRESIDENT, Dr. GEORGE M. STERNBERG, Major and Surgeon United States Army, also opened with special reference to the interest of the Association in Memphis, and

THE IMPORTANCE OF A NATIONAL HEALTH SERVICE.

He said :

“ We feel that the good city of Memphis is, in a manner, a *protégé* of our Association, because in her hour of distress she appealed to some of our distinguished members for sanitary counsel, and acted upon the advice given ; and we recognize the fact that in more than one way our relations to this city are exceptional.

“ It was due to the yellow-fever epidemic of 1878, in which Memphis was the chief sufferer, that steps were taken at our meeting of that year, in the city of Richmond, to urge upon Congress the importance of a national board of health. Recognizing the fact that epidemics do not respect State boundary lines, and that an efficient sanitary service in times of emergency requires a liberal expenditure of money, and unity of action on the part of sanitary officials, we urged the formation of a central health board, and for a time it seemed as if our well-meant plans would be crowned with success. Indeed, they were crowned with partial success, for all must recognize that in the early days of its existence the National Board of Health accomplished much good. It is unnecessary for me to refer to the various circumstances which conspired to paralyze the effective energy of this board. Unhappily, it is a thing of the past, and the hopes which we had founded upon this our bantling are but a memory of the past. But we should not be discouraged that our first effort has failed. A careful consideration of the circumstances which led to this failure may enable us to mature a better plan. Such a plan, endorsed by the judgment of the experienced sanitarians here assembled, and properly presented to our national legislators, could not fail to receive respectful attention.

“ One thing appears to me to be thoroughly demonstrated by the experience of the past—namely, that a central health board, to be efficient, must be attached to one of the departments of the Government now in existence, so that it may be



under the protection of a Cabinet officer. It would be useless to ask at the present time that the sanitary interests of the country may be represented by an additional Cabinet officer, a minister of public health, although there can be no doubt that the interests involved are sufficiently important to justify such an innovation. But we may at least demand that the sanitary interests of the people of the United States shall receive the same consideration from the National Government that is accorded to the educational interests, the agricultural interests, etc. We may at least ask for a bureau of public health, with a commissioner at its head, and with the necessary secretaries and clerical force to make it efficient; and attached to such a bureau should be a well-equipped laboratory in which expert bacteriologists, chemists, and sanitary engineers should be employed in the experimental investigation of unsettled sanitary problems, such as the natural history of disease germs, the best methods of destroying them, protective inoculations against infectious diseases, problems in sanitary engineering, such as the disposal of sewage, domestic sanitation, etc.; food adulterations, and a variety of other questions of equal importance, which will readily occur to you. I do not approve of the plan of having a central board of health, composed of members located in various parts of the country. Such an organization is cumbersome, and it cannot be expected that a board which is only assembled at long intervals, and of which the members are occupied by various pursuits, which claim their time and best thought, will render the most efficient service. On the other hand, by diversity of opinions they may greatly embarrass their executive officer, who must necessarily be located in Washington. Nor, in my opinion, would a board composed of officials at the head of various departments in Washington, such as the surgeon-general of the army, the navy, and the marine hospital service, as has been suggested, be much better. These officials are fully occupied with the duties pertaining to their office, or at least have not sufficient leisure to undertake the executive work of a central health bureau. I would therefore expect better results from the untrammelled action of a single commissioner, who would be responsible directly to the Cabinet officer to whose department his bureau was attached, and who

would necessarily be controlled by the law defining the nature of his duties. In this case it is evident that the good accomplished would depend largely upon the fitness of the man selected for the special duties entrusted to him, and that a political appointment in the first instance, or the removal of a suitable man for political reasons, would entirely defeat our object.

"We may, however, ignore this possibility, and trust to the good judgment of the chief executive and the growing public sentiment in favor of retaining efficient bureau officers, without regard to party changes.

"In connection with a bureau of public health, it would certainly be desirable to have an advisory board of health, to which the commissioner could refer questions for consideration, or which could advise him of new measures, or desirable changes in his regulations, which, after full discussion, commended themselves to the judgment of the board. Such a board should have no executive power, and the members should receive no pay beyond their actual expenses in attending the appointed meetings. I would suggest that such a board should consist of the surgeons-general of the army, the navy, and the marine hospital service, and of the presidents of State boards of health. One annual meeting in Washington would probably answer the purpose for which a board would be constituted, except in case of an actual or threatened epidemic, when it might be convened at the suggestion of its president or of the commissioner of health.

"I request your careful consideration of the plan here suggested, and if it meets your approval, would urge the importance of taking such action at the present meeting as will insure its being properly brought before the Congress of the United States.

"My reference, at the outset of my address, to the Richmond meeting of this Association will recall to those of you who were fortunate enough to be present at that meeting the very great interest which attached to the reading of reports upon the epidemic of that year; and especially will you recall the scene when our lamented colleague, Dr. Samuel M. Bemiss, of New Orleans, occupied the platform. Surrounded by diagrams showing the topographical features of the towns

in the great Mississippi Valley which had suffered most from the epidemic, and with tabular statements of population, mortality, etc., Dr. Bemiss, with the clearness and precision which characterized his delivery, passed in review the terrible record of the devastating pestilence. His genial and rugged face aglow with humanitarian zeal and an intelligent appreciation of sanitary lessons conveyed by the stern facts which he presented to us, made an impression upon my mind which will not soon be effaced. Alas! that he is not here with us to congratulate the good citizens of Memphis upon the favorable change which has occurred in their sanitary surroundings since the date of which we are speaking.

“Sanitarians recognize the fact that epidemics are often blessings in disguise, just as great fires may be in badly built cities. Certainly not a blessing for those who suffer directly from the scourge; but the traveller who sees broad and well-paved streets, substantial and well-ventilated dwellings, and a healthy-looking population, where formerly narrow, filthy streets and crowded tenement-houses occupied the ground, may be excused for looking upon the conflagration which cleared the way for such improvements as a blessing. So, too, sanitarians, recognizing the fact that in many instances nothing short of an epidemic will arouse the people to take action with reference to sanitary improvements, cannot fail to see that the benefits which result from an epidemic of cholera, or of yellow-fever, in the long run may more than compensate for the distress and loss of life which attends them. A cholera epidemic which decimates the population of a town without sewers or proper water-supply will prove a blessing in the end if it leads to the introduction of an ample supply of pure water and of a system of sewerage by which the mortality from typhoid-fever and other epidemic diseases is greatly reduced. But this mode of obtaining sanitary improvements is an expensive one, and rather hard on the victims of the epidemic.

“The members of this Association, therefore, actuated by a humanitarian spirit, desire to secure these benefits for every town in this broad land, if possible, in advance of the scourge, which is sure to come some day if their warning and the lessons of past experience do not suffice to arouse the inhabitants of unsanitary towns to a sense of the risks they run. It



is a remarkable fact that in matters of this kind individuals and corporations are slow to profit by the experience of others, and that it is commonly only when the fatal results of neglect are brought under their immediate observation that they are ready to apply the remedy, which is necessarily more or less expensive. We all remember how promptly the people of Memphis responded when the epidemic stimulus was applied, and we have heard much of the sanitary improvements which have been made in this city since the memorable years of 1878 and 1879. Many of us are here for the first time, and, as I have said, this meeting possesses special interest for us, because it enables us to see for ourselves what has been done in order to put Memphis in a state of defence in the event of another yellow-fever epidemic in the Mississippi Valley.

“Do not allow yourselves to fall into a state of inaction and false security because for several years our foe has been kept at bay. Although it is now evident that yellow-fever is not epidemic in any portion of our land, and we have learned by recent experience that by proper measures it is possible to exclude it for a series of years, even from the city of New Orleans, yet there are so many possibilities of its introduction, in spite of the vigilance of those who have charge of the gateway of the Mississippi Valley, that it would be folly to neglect those local measures of sanitation which remove the vulnerability of cities in the presence of the germs of pestilential diseases. Shutting the door is of prime importance, and while the keys are in the hands of our energetic and able colleague, Dr. Holt, we may feel comparatively safe. But the efficient president of the Louisiana State Board of Health cannot guarantee that all avenues of approach are securely guarded, inasmuch as some of these avenues are quite beyond his control. This is exemplified by the Biloxi epidemic of 1886. Local outbreaks such as that at Biloxi, and the epidemic at Key West and at Tampa during the present year, show that the conditions upon our gulf coast are no less favorable to the presence of yellow-fever than they were in former years, and that our immunity depends solely upon the exclusion of an exotic germ. Unfortunately, also, the Biloxi epidemic illustrates the very greatest liability of physicians to fall into error with reference to the diagnosis when yellow-fever unex-



pectedly makes its appearance outside of its habitual range. History repeats itself in this particular. The early cases in an epidemic, which are often mild, are pronounced to be malarial-fever, and this diagnosis is often sustained by those who have committed themselves to it, when no reasonable doubt remains in the minds of unprejudiced physicians as to the true nature of the malady.

WHAT NATIONAL SERVICE HAS DONE AND IS DOING IN  
ENGLAND.

“The question whether it is practicable to make a city which lies in the area subject to invasion proof against epidemics of yellow-fever and cholera is one of very great importance. At the International Sanitary Conference of Rome the delegates from England and from India opposed all quarantine restrictions as unnecessary, and pointed to the fact that for years there has been constant and free communication between cholera-infested ports in India and the seaport cities of England, but that cholera has not effected a lodgment in that country. Dr. Thorne Thorne, of the local Government Board, a delegate to the conference, ascribed this immunity to the sanitary improvements which have been carried out in England during the past ten or twelve years. He stated that, during the period included between the years 1875 and 1884, an amount exceeding six and one quarter millions sterling per annum had been expended in England ‘under private and public acts mainly of a sanitary character.’ Dr. Thorne Thorne, in his report of the proceedings of the conference referred to, says :

“ ‘Lastly, I would note that I took occasion to explain to the technical commission that expenditures, such as I have referred to, are, with only very trivial exceptions, voluntarily incurred in the interests of public health.

“ ‘I then went on to show, in connection with this expenditure, that the average annual mortality for England and Wales was now only 19 as opposed to 22 per 1000 in the decennial period 1861–70, and this notwithstanding increase in population of some 5,000,000 ; and taking the continued fever mortality of this country as that which, in point of causation, most nearly resembled cholera, I pointed out that, whereas,

in the five years 1865-69 this mortality was at the rate of 934 per 1,000,000 living, it had steadily fallen to 428 per 1,000,000 during the period 1880-82, and that it is now only 307 per 1,000,000.'

"In a letter communication, published in the *Practitioner* for October, 1887, Dr. Thorne Thorne gives fuller details of the English system of protection against cholera as follows :

" ' Having deliberately abandoned the system of quarantine, we began many years ago to organize the system of medical inspection with isolation. The medical inspection comes first into operation on our coasts. The customs officers board the vessel coming into our port, and they at once communicate to the sanitary authority the occurrence of any case of cholera, choleraic diarrhœa, or suspected cholera. A vessel so affected is detained until the medical officer of health has examined every member of the crew and passengers. Those actually sick of cholera or choleraic diarrhœa are at once removed to the port sanitary hospital, and any person certified to be suffering from any illness which that officer suspects may prove to be the cholera is detained for a true period of observation not exceeding two days. The medical inspection is thus followed by isolation of the sick. Unlike a quarantine system, this process does not interfere with the healthy, or expose them to risk by herding them together with the sick, but the names of the healthy, and the places of their destination, are taken down, and the medical officers of health of the districts in question are informed of the impending arrivals. This part of our system has been named our first line of defence, but it would be of little value if we stopped there. Our main trust is in the promotion of such local sanitary administration in every part of the country as shall rid us of the conditions under which alone cholera can spread. In periods of emergency, as during the past three years, a special medical survey of such districts as are most exposed to risk is organized under the supervisor of the medical officer of the local government board, and where needed the sanitary authorities are urged to action. Important as have been the results of the recent survey, they would go for little were it not for the steadily maintained work of the sanitary authorities and their officers throughout the kingdom ; and we who

have been taunted abroad for opposing quarantine, because its restrictions touched our commercial interests and pockets, may justly feel proud that in England and Wales alone the people have, during the past ten years, of their own accord, and apart from Government dictation, spent by way of loan or in current expenditures, over £80,000,000 sterling for purposes mainly of a sanitary character. And we may fairly ask whether any corresponding expenditure has in other countries given evidence of real faith in a quarantine system.'

"Without denying the value of the sanitary improvements which have been carried out in England, and the possibility that her immunity from cholera is largely due to them, the delegates from more exposed countries, such as France and Italy, demanded a quarantine station upon the Suez Canal, and pointed out the fact that their seaport cities were not in such a sanitary condition that they could hope to escape the ravages of the pestilence, in case of its introduction, and that to place them in such a state of defence would require time and the expenditure of large sums of money. It was noticeable that those countries, such as Turkey, Egypt, and Spain, where sanitary improvements have made the least progress, were the most exacting with reference to quarantine restrictions. They evidently looked upon these as their only hope, and were advocates of the old-fashioned time quarantine, which, as carried out in these countries, has often been attended with barbarities which are intolerable for civilized nations. Self-preservation is, indeed, the first law of nature, but it is barbarous to sacrifice the life of another to save our own, and in guarding the lives of a community, we are bound to show due consideration for the health and comfort of those who are believed to be the possible bearers of disease germs.

#### WHAT 'QUARANTINE' SHOULD BE.

"Recognizing this humane principle, a majority of the delegates to the sanitary conference of Rome were anxious to effect a compromise between the old-fashioned time quarantine and the British practice, which they could not rely upon for the countries of Southern Europe. It was believed that such a compromise was practicable, and that the plan agreed

to by a majority of the delegates present was more reliable than a simple quarantine of detention. I must refer you to the published transactions for the details of this plan ; but, in brief, it consisted of a sanitary supervision of ships at the port of departure, when this was an infected port or in communication with an infected locality ; in the sanitary supervision of ship and passengers while in transit by a properly qualified physician upon all passenger ships ; and in such detention at the port of arrival as might be necessary for the disinfection of the ship, the personal effects of the passengers, etc. If one or more cases of cholera should appear on board during the voyage they were to be isolated and rigid measures of disinfection carried out, and the action of the health authorities at the port of arrival was to depend largely upon how effectively this had been done. In short, the treatment of the vessel and its passengers was not to be determined in advance by arbitrary rules, but was to be governed by an intelligent consideration, by an expert, of all the circumstances relating to the sanitary history of the ship from the date of its departure from the infected port.\* This rational quarantine service, which is far less burdensome to the commerce of a country than the arbitrary time quarantine of former days, has proved itself to be also more effectual in accomplishing the end in view. This is amply proved by recent experience in our own country, where, to a large extent, the principles indicated control the action of the health officers of our principal seaports. Look at the city of New Orleans, where epidemics of yellow-fever were formerly so frequent as to lead to the belief that the disease was epidemic, and a necessary evil appertaining to the situation of the Crescent City. Happily, under an efficient quarantine service, she has now a record of seven years' exemption from the dreaded pestilence.

“ It is, perhaps, too soon to speak with confidence with reference to the action taken by the sanitary officials of the port of New York upon the recent arrival of two cholera-infected vessels from the Mediterranean, but we have good reason to hope that the measures taken will prove sufficient,

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\* The system contemplated in detail by the Committee on Quarantine Regulations, Fourth National Quarantine and Sanitary Convention, Boston, Mass., 1860, pp. 157-216.—A. N. B.



and that this pestilential disease, which has for several years been threatening us from a distance, has not effected a lodgment upon our shores. Whether it would be practicable to put our seaports in such a state of sanitary defence that it would be safe to open the door and defy the foe is extremely doubtful. I have never believed that yellow-fever was excluded from New Orleans in 1862 and 1863 by the sanitary regulations enforced by General Butler, as has been claimed. The exemption from this disease enjoyed by the unacclimated soldiers from the North, who filled the hospitals in that city at the time mentioned, was due, in my opinion, to the absence of commerce during the military occupation of the city and to the rigid enforcement of quarantine restrictions.

“ But I do believe that this and other cities similarly located can be preserved from such devastating epidemics as have too often occurred in the past, and that by the carrying out of needed sanitary improvements and the constant supervision of expert sanitary officials, supported by an enlightened public sentiment and sufficient appropriations, the ravages of pestilential diseases may be restricted within very narrow limits.

“ As regards cholera, the system of local defence is even simpler than in the case of yellow-fever. Ample evidence demonstrates that the epidemic extension of this disease depends largely, if not exclusively, upon the water-supply. Where this is subject to contamination by the discharges of the sick, there cholera is liable to become epidemic. On the other hand, cities like Rome, in Italy, which have an ample supply of pure water, drawn from a source not likely to be contaminated, seem to be cholera proof, notwithstanding the filth and squalor in which a considerable portion of the population live. The same thing is seen in Naples, which, in 1884, suffered terribly, but which, since the completion of its new system of water works, in 1885, has enjoyed a comparative immunity, notwithstanding the fact that cholera still prevails in Italy, and that we have evidence of its presence in a malignant form in the city referred to. When I was in Naples, in 1885, the mayor of the city invited a number of the delegates to the sanitary conference to the municipal palace, for the purpose of conferring with them with reference to projected sanitary improvements, and especially with reference to the

best system of sewerage for the city, which, up to the present time, remains destitute of sewers, and which, I may add, is a noted stronghold of typhoid-fever. In the course of the conversation, I suggested to the mayor Colonel Waring's American system, which has been tested with such favorable results in this city. My recommendation was sustained by the distinguished German bacteriologist, Dr. Robert Koch, who was one of the delegates present. I may remark that I have recently received a letter from Dr. Koch, asking me to give him full particulars with reference to the details of this system as carried out in the city of Memphis.

#### QUARANTINE ABUSES AND SUGGESTIONS.

“I am not willing to leave the subject of quarantine, to which I have briefly referred, without placing myself upon record with reference to a matter in connection with it which I consider one of the greatest importance. The practice which has come down to us from former times, when questions relating to abstract justice and individual rights had but little consideration in face of a danger to the community, of taxing commerce for the support of quarantine establishments, I consider one that is wrong in principle and unjust to those who are required to bear the burden. It seems to me to be evident that the people protected should pay the cost of such protection, and that quarantine establishments should be supported at the expense of the National Government, or of the States in which our seaports are located, and not by a tax upon the shipping entering these ports. I am not so much concerned, however, with the unjust tax upon ship-owners as with the gross injustice to passengers practised at many ports in various parts of the world, when they are so unfortunate as to be detained at a quarantine station. Humanity demands that a sick person who is detained for the protection of a community should receive the best possible care, and justice requires that both sick and well, while detained at a quarantine station, should be well fed and well lodged without expense to themselves. Moreover, at a quarantine establishment which is supported by a tax upon ships and upon the passengers detained, an unscrupulous official may add to the hardships of passengers detained the barbarity of an unnecessary detention

from a venal motive. I trust that such things do not happen in our country, but to show how unjust the principle of taxing the passenger for his support while under detention in quarantine is, I will mention a circumstance which recently fell under my own observation :

“ When I left Brazil in the month of August last, small-pox was epidemic, both in Rio de Janeiro and at Para ; our ship touched at Para and five days later at Barbadoes. A passenger for this port was not allowed to land, because of the prevalence of small-pox in Brazil. Proceeding to St. Thomas, less than two days' sail from Barbadoes, our passenger was again refused permission to land, except to go to the quarantine station for a certain number of days. This was all right, but the conditions upon which he would be received seemed to me to be all wrong. Either he himself or the ship must guarantee the payment of the quarantine fees, which would be \$3 a day for his board and \$5 a day to the quarantine physician if he were alone. If others were at the station at the same time this fee would be divided between them. One can easily imagine what a hardship such a tax would be for a person of limited means, who had only provided himself with funds for the journey he had undertaken. The agent of the ship refused to take any responsibility, and our passenger had no resource but to submit to the imposition or to come on to New York, paying his passage to that port.

“ As another illustration of the evils arising from the present system of supporting quarantine establishments, I will mention a circumstance which occurred upon our arrival at the port of New York. With the deputy health officer, who boarded our ship, came a man with a jug. I was informed by one of the officers of the ship that he was to disinfect the vessel. Being somewhat curious to know the method of disinfection employed, I asked the ship's surgeon to go with me to inspect, when, after a detention of less than one hour, we had started from the quarantine station for our wharf. We found that the man with the jug had lowered a bucket by means of a rope through one of the hatches between decks. Upon pulling up this bucket I found that it contained two or three pounds of some powder which had been wet, probably with acid solution, and which gave off an odor of chlorine. No doubt when

first lowered between decks there had been a considerable evolution of chlorine, but in the vast space to be disinfected, it was so diluted that at the end of an hour I did not detect the odor of chlorine gas when I lifted the hatch, and it was only by approaching my nose to the bucket that I was able to ascertain what disinfectant had been used. The most curious part of the story is that I was informed that the bucket had been lowered between decks to disinfect a quantity of hides which were stored in the hold. What was the object of this 'disinfection'? Evidently not to disinfect, for no one at the present day would think of maintaining that the hides in the hold had been disinfected by the procedure of the man with the jug.

"The only object that I can conceive of depends upon the fact that there is a fee for disinfecting, which must be paid by the agents of the ship; at least I was so informed by one of the officers of the ship.

"Gentlemen, we cannot control the action of sanitary authorities abroad, and if we are ever so unfortunate as to be thrown into a lazaretto in one of those countries where the rights of the individual are counted as nothing, God pity us! for the fact that we are American citizens will be of no avail. But we can at least correct abuses, if such exist, at our own seaports, and set an example to other nations of an enlightened policy, which will not only redound to our credit, but will directly benefit our languishing commerce. The most enlightened nations of Europe recognize the importance of a uniform system of quarantine administration, based upon past experience and recent progress in sanitary science; and this has been one of the principal objects in view in the assembling of expert delegates from the various countries interested for international sanitary conferences.

"The first international conference was that of Paris in 1852. A second sanitary conference assembled in the same country in 1859 for the purpose of revising and simplifying the conclusions adopted in 1852; the next conference was that of Constantinople in 1866, and this, like the last conference assembled in Rome in 1885, at the call of the Italian Government, followed immediately after an epidemic of cholera, and had special reference to the restriction of this disease. The



conference at Vienna followed in 1874, and that of Washington in 1881. The latter, following after our yellow-fever epidemics of 1878 and 1879, had the special object in view of establishing an international system of notification of the appearance of epidemic disease in all parts of the civilized world, and of the sanitary condition of seaport cities, and especially of ships sailing from infected ports.

“Unfortunately, all attempts to establish an international code of quarantine regulations have thus far failed, owing to the very diverse opinions held by the delegates from the several nations who have been assembled for this purpose, and to the conflicting interests of some of the great powers. While as a nation we have taken part in these sanitary conferences, and have advocated an enlightened and uniform policy of quarantine administration, and international notification of infectious diseases, we have as yet no uniformity in the quarantine regulations of our own seaport cities, and no central health bureau. Gentlemen, it is well for us to consider these matters, and to point out to our legislators the present unsatisfactory condition of affairs with reference to the subjects referred to.

“As I have already intimated, the exotic pestilential diseases to which I have referred are the levers which move corporations to make necessary sanitary improvements. But for sanitarians, aside from their effect in this way, they are of secondary importance. The number of victims which they claim is a small matter compared with the number who succumb to certain indigenous or naturalized infectious diseases, which are equally subject to control by well-known sanitary measures.

#### THE PREVENTION OF ENDEMIC DISEASES.

“The chief aim of the American Public Health Association should be to ascertain what measures are most effectual for the prevention of endemic maladies, such as typhoid-fever and the malarial-fevers, and for the banishment of all diseases in which the contagion is given off from the persons of the sick, such as scarlet-fever and small-pox. So far as the diseases of the class last mentioned are concerned, we may safely say that we know how they may be banished from a community—viz.:

by isolation of the sick and disinfection of all infectious material ; and in the case of small-pox by vaccination. Our main mission, therefore, is to insist upon the thorough execution of these measures. But our mission does not cease here.

“ We have not only to teach the American public how to guard against infectious diseases by quarantine restrictions, isolation of the sick, disinfection and municipal sanitation, but also to teach them the principles of personal hygiene. Not only will their individual susceptibility in the presence of an epidemic depend largely upon their personal habits and mode of life, but we must show them how often organic and functional diseases of the various organs essential to life are induced by excesses in diet, improper food, the habitual use of spirituous liquors, etc. I conceive that a most important part of our work in the future should consist in popularizing information of this kind. The noble example set by our generous colleague, Mr. Lomb, of Rochester, should be followed by our Association, if its finances permit ; or at least we should present the subject to philanthropists who, like Mr. Lomb, may desire to be guided by our counsel in their efforts to do good to their fellow-men. As a matter of fact, our limited means will not justify us in offering prizes for essays on sanitary subjects, and the most that we can afford is to print and distribute at cost such essays as may seem suitable for popular distribution.

“ In another direction, however, we may accomplish much good with comparatively small amounts of money, whenever our treasury will admit of it. I refer to special investigations in sanitary science, committed to expert investigators, who are willing to devote their time to the work, and who would ask only for such sums as might be necessary to cover the actual expenditures for apparatus, material, etc.

#### ETIOLOGY OF INFECTIOUS DISEASES—BIOLOGICAL INVESTIGATIONS.

“ The exact knowledge which has been obtained during the last decade, with reference to the etiology of the infectious diseases, has been promptly applied in a practical way by sanitarians ; and every addition to our knowledge in this direction is of the greatest importance to sanitary science, which, so far

as we can see, will reap far more benefit from an exact knowledge with reference to the essential characters of each specific disease germ than can be hoped for by the clinician.

“It is not creditable to us as a nation that so small a share of the progress in this direction is due to American investigators. In the absence of any department of the National Government having the power and disposition to support investigations in this field of science, the few who have pursued bacteriological studies in this country have worked under disadvantages, which were not only discouraging, but absolutely incompatible with the most efficient work and fruitful results. But the future is more hopeful. Individual munificence, in several of our large cities, has supplied the means, which should have been provided long since by the National Government, for pursuing investigations in bacteriology and in experimental pathology.

“In Baltimore we have a well-equipped bacteriological laboratory, under the direction of the able Professor of Pathology of the Johns Hopkins University. In New York, Boston, Philadelphia, and, I believe, in several other cities, bacteriological laboratories have been established in connection with well-known medical schools.

“In Brooklyn the Hoagland Laboratory, now in process of construction under the immediate supervision of the gentleman who provides all of the funds required for the building and its equipment, will supply all of the facilities, both for students and for advanced investigators, which can be found in the best-equipped laboratories of Europe. I am informed also that our colleagues from the State of Michigan, who are always in the front rank in urging upon their Legislature measures which will advance the sanitary interests of the State, have secured the establishment of a bacteriological laboratory in that State. We have to thank one of our colleagues from the State mentioned for a most important discovery in the field of sanitary science. I refer to the discovery of tyrotoxicon by Professor Vaughan. With a well-equipped laboratory under his direction, there is good reason to believe that this discovery, so creditable to American science, would not stand alone to the credit of the good State of Michigan.

“Our Association has already taken the initiative in encour-

aging and assisting from its slender treasury investigations in sanitary science. The committee on disinfectants, appointed at the St. Louis meeting in 1884, has made an extended experimental research with reference to the value of various agents for the destruction of disease germs. The final report of this committee will be submitted at the present meeting. I say final, because, in my judgment, all the necessary data are now at hand for determining the agents most useful for disinfecting purposes under various circumstances, and I think the conclusion of the committee may be accepted as a safe guide for future practice. It is true that more work can be done to advantage in this direction, and it will be desirable to test from time to time new agents which may be suggested for disinfecting purposes ; but the main object of the Association has been accomplished, and we now know what agents can be relied upon for the destruction of disease germs of various kinds, and in what proportion these agents must be used to be efficient.

“ In consideration of the limited means at our disposal for the encouragement of sanitary problems, I would suggest that the Association raise a special fund for this purpose, by calling for contributions from its members, and from others who may be willing to aid us in our efforts in this direction. If you approve of this suggestion, I trust that some member will introduce the necessary resolutions.

“ One of the subjects which might be taken up by a committee appointed for the purpose, and aided from the special fund, would be a biological investigation of the water supply of towns and cities in the United States. Evidently such an investigation would be a protracted one, and it would be advisable to begin with those towns which have a notoriously bad water supply. Perhaps it could be arranged that a portion of the expense, at least, would be paid by the town or city whose water supply was examined, as the inhabitants of such town or city would be especially interested in the results of the investigation.

“ Another question of the greatest interest to us is that which relates to the possibility of protecting individuals from fatal infectious diseases by inoculation with an attenuated virus.



“Protection from small-pox is no longer a solitary instance of prophylaxis by inoculation. In anthrax, in swine plague (rouget) and in pleuro-pneumonia protective inoculations have been practised upon a large scale, and the value of the method is fully demonstrated. The evidence in favor of Pasteur's inoculations for the prevention of hydrophobia is such that we can scarcely doubt that it has a relative virtue, notwithstanding the considerable number of deaths which have occurred among those who have been inoculated. The recent report of the English commission, made after a thorough investigation, is favorable to the method, which may, perhaps, hereafter be modified so as to give still better results.

“In the various infectious diseases of the lower animals which have been studied during recent years, including those forms of septicæmia which are only known to us by laboratory experiments, we have much evidence that protective inoculations with an attenuated virus may be successfully practised. And there is good reason to hope that in all diseases in which a single attack protects from future attacks, protective inoculations may be practised when once we have succeeded in isolating and cultivating outside of the body the specific infectious agent. We know already four methods by which the virulent potency of disease germs may be attenuated—viz.: by exposure to oxygen, by exposure to heat, by exposure to the action of certain chemical agents, and by passing through the body of certain animals.

“The last-mentioned method is that practised by Pasteur in attenuating the virus of rouget. He finds that the virulence of the microbe is diminished by passing it through a series of rabbits, and that by this means an attenuated virus suitable for protective inoculations in swine may be obtained.

“The possibility of attenuating a virus by exposure to the action of certain chemical agents was discovered by myself in 1881, in the course of a series of experiments upon disinfectants, in which the virus used was the blood of a rabbit, just dead, and containing the micrococcus found in the buccal secretions of man, which I have named *M. Pasteuri*.

“Among the diseases in which there is good reason to hope that a method of prophylaxis by inoculations with an attenuated virus might be successfully practised, if we could once

succeed in isolating and cultivating the specific germ of the disease, is yellow-fever, a disease in which, as a rule, a single attack protects.

“As you know, it has been claimed both by Dr. Domingoes Freire, of Brazil, and by Dr. Carmona V. Valle, of Mexico, that the yellow-fever germ is discovered, and that a method of prophylaxis by inoculation has been experimentally demonstrated. As I have just returned from a special mission, the object of which was to investigate the claims of these gentlemen, you will naturally expect to hear from me at this time with reference to the results of my investigations. I regret to say that I am unable to gratify you in this natural expectation. My orders explicitly direct me ‘not to make publication of my investigations and of the conclusions reached by me’ until I have submitted my final report to the President of the United States. . . .

“It is now generally recognized that the only safe basis for practical sanitation is that which is afforded by an exact knowledge of the etiology of infectious diseases, and of the biological characters of the specific infectious agents in these diseases. Since the importance of these studies has been generally recognized, and the methods of research have been perfected, the number of trained workers has rapidly increased, and at present the greatest activity prevails in the laboratories of Europe. This is shown by the number of memoirs relating to experimental investigations made in this department of science which are constantly appearing in the journals devoted to medicine and hygiene in all parts of the world, but especially in Germany, in France, and in Italy. The *Fahresbericht*, of Baumgarten, for the year 1886, contains abstracts of 533 papers relating to micro-organisms. With reference to cholera, I may say to you that recent researches give support to the conclusions of Koch as to the pathogenic rôle in this disease, of the spirillum discovered by him in the intestines of cholera patients. Its constant presence in this disease seems to be demonstrated, and it is now generally admitted by bacteriologists that there are definite characters by which it may be distinguished from similar organisms obtained from other sources, such as the Finkler-Prior spirillum and the cheese spirillum of Deneke, which closely resemble it.

"Lustig, Director of the cholera hospitals at Trieste, examined the dejecta in 170 cases of cholera and found the spirillum of Koch in every case; on the other hand, the bacillus of Emerich was only found in forty out of the whole number of cases examined; Tizzoni and Cattani also found Koch's spirillum in the contents of the intestine in twenty-four cases examined by them during the epidemic at Bologna in 1886. At Padua, also, researches made by Canestrini and Morpurgo gave the same result, the spirillum was constantly found in the dejecta in recent cases. These observers state that the cholera spirillum retains its motility and reproductive power for a considerable time in sterilized distilled water. They were able to obtain cultures after two months from such water. This important fact has been verified by Pfeiffer, who found, however, that in the presence of common saprophytic bacteria the cholera microbe soon died out. Hueppe has shown that the cholera spirillum forms reproductive elements, which he calls arthrospores. These are not so readily destroyed by desiccation as are the fresh bacilli, but they have nothing like the resisting power to heat and chemical agents which characterizes the endogenous spores of the bacilli. The exact proportion in which various disinfecting agents are destructive of the vitality of the cholera spirillia has now been determined with great precision, and will be stated in detail in the report of your committee on disinfectants for the present year. This committee has also made extended experiments of the same kind, in which the typhoid bacillus and various other pathogenic organisms have served as the test of germicide power. The chemical products developed in cultures as a result of the vital activity of the cholera spirillum have been studied by Bitter, Buchner, and Contani. The last-named author claims to have demonstrated the presence of a poisonous ptomaine in cholera cultures which, when injected into the peritoneal cavity of dogs, gives rise to symptoms resembling those of cholera. A recent observation of value is that of Bujwid, who finds that bouillon cultures of the cholera spirillum have a peculiar chemical reaction by which they may be distinguished. According to this author the addition of a 5-10 per cent solution of hydrochloric acid to such a culture gives rise, within a few minutes, to a rose-violet color, which subsequently, when



exposed to light, changes to a brownish shade. The reaction does not occur in impure cultures. The Finkler-Prior spirillum is said to give a similar reaction after a longer time, but the color first developed is of a more brownish hue.

“The question of the etiological *rôle* and biological characters of the typhoid bacillus discovered by Eberth in 1880 has occupied numerous bacteriologists during the past year, and very important additions have been made to our knowledge with reference to this organism. The researches of Beumer and Peiper, of Seitz, and of Frankel and Simmonds, are especially worthy of notice, but time will not permit me to give an abstract of the results reached by these and other investigators. I can only say in a general way that the earlier researches of Eberth, Koch, and Gaffky are confirmed as regards the presence of this bacillus in the intestinal glands, the spleen, and other organs in typhoid cases, and that very little doubt exists among bacteriologists as to the etiological relation of this organism to the disease in question, although no satisfactory proof by inoculations in lower animals has yet been found. This, however, is not surprising, inasmuch as we have no evidence that any of the animals experimented upon are liable to contract the disease, as man does, by drinking contaminated water.

“According to Wolffhugel and Riedel, the typhoid bacillus and various other pathogenic organisms tested, retain their vitality for a long time when preserved in ordinary well or hydrant water, and even undergo a considerable development in such water. Frankland, also, has found that certain pathogenic bacteria tested by him increased rapidly in numbers in the water of the Thames, and even in distilled water. Meade Bolton, on the other hand, found that micrococcus tetragonus, staphylococcus aureus, the typhoid bacillus, and the anthrax bacillus not only did not increase in number in sterilized water, but soon perished, while certain non-pathogenic species commonly found in water increased rapidly in numbers in sterilized distilled water. A more recent research is that of Kraus, who employed well water and hydrant water from the city water-works of Munich, which, without being sterilized, was infected with pure cultures of various pathogenic organisms diluted with distilled water. The infected



water was kept during the experiment at a temperature of  $10\frac{1}{2}^{\circ}$  C. Plate cultures were made from day to day. The results were as follows: The typhoid bacillus had disappeared by the seventh day, the cholera spirillum could not be found in plate cultures after the second day, the anthrax bacillus had disappeared at the end of four days; in the mean time the ordinary water organisms had increased enormously in number. From these experiments, considered in connection with those of Bolton and Wolffhugel, Kraus concludes that the rapid destruction of pathogenic bacteria in non-sterilized water is a direct result of the action of ordinary water organisms. If this be true, it is evident that these water bacteria are conservative from a sanitary point of view, and that the biological test of drinking water which gives the number of colonies which are obtained from a given quantity has no special value in the absence of an exact statement of the kind of bacteria and their pathogenic potency. The time has come when we must demand that those who undertake the biological examination of water, with reference to its potability, shall give some more definite information than that a certain number of colonies were found, some of which liquefied gelatine and some did not. Up to the present time we have but few instances of the finding of known pathogenic bacteria in water used for drinking purposes. Koch found his spirillum in a water-tank in India, and several observers have reported the finding of the typhoid bacillus in drinking water. Recently Beumer examined the water of four wells in a vicinity where cases of typhoid-fever had repeatedly occurred. From one of these wells colonies were obtained by the plate method which proved to have all of the characters of typhoid bacillus. The distinguished German chemist, Brieger, has succeeded in obtaining a toxic ptomaine from cultures of the typhoid bacillus which has the composition C 7, H 17, N O 2.

“The question of the etiology of croupous pneumonia has received much attention during the past year, and it is now evident that the bacillus of Friedlander, which has been cultivated for some years in the laboratories of Europe under the name of ‘pneumococcus,’ is not entitled to this distinctive appellation. On the other hand, evidence is accumulating that a micrococcus, which I have described under the name of

M. Pasteuri, and which is found in normal human saliva, is far more frequently found in the exudate into the alveoli during the acute stage of croupous pneumonia than is that of Freidlander. I first experimented with this micrococcus in 1880, and isolated it in pure cultures in 1881, but it was not until January, 1885, that I discovered its presence in pneumonic sputum and made inoculations in rabbits with this material.

“ The record of my first successful experiment, published in the *American Journal of the Medical Sciences*, for October, 1885, is as follows : ‘ January 2d, 1885. Inoculated two rabbits subcutaneously with pneumonic sputum, collected with great care by my friend, Dr. Rohé, and brought to me at once, from a white male patient, aged nineteen, in the seventh day of illness, second day of bloody expectoration. Both rabbits were found dead on the morning of January 4th. In both, the pathological appearances were identical with those constantly observed by me in rabbits killed by the subcutaneous injection of my own saliva—viz.: Extensive inflammatory œdema extending from point of injection, enlarged spleen, and presence of oval micrococci in blood and in effused serum in the subcutaneous connective tissue.’ In the same paper I say :

“ ‘ It seems extremely probable that this micrococcus is concerned in the etiology of croupous pneumonia, and that the infectious nature of this disease is due to its presence in the fibrinous exudate into the pulmonary alveoli.

“ ‘ But this cannot be considered as definitely established by the experiments which have thus far been made upon lower animals. The constant presence of this micrococcus in the buccal secretions of healthy persons indicates that some other factor is required for the development of an attack of pneumonia ; and it seems probable that this other factor acts by reducing the vital resisting power of the pulmonary tissues, and thus making them vulnerable to the attacks of the microbe. This supposition enables us to account for the development of the numerous cases of pneumonia which cannot be traced to infection from without. The germ being always present, auto-infection is liable to occur when from alcoholism, sewer-gas-poisoning, crowd-poisoning, or any other depressing

agency, the vitality of the tissues is reduced below the resisting point. We may suppose also that a reflex vaso-motor paralysis, affecting a single lobe of the lung, for example, and induced by exposure to cold, may so reduce the resisting power of the pulmonary tissues as to permit this micrococcus to produce its characteristic effects.

“ ‘ Again, we may suppose that a person, whose vital resisting power is reduced by any of the causes mentioned, may be attacked by pneumonia from external infection with material containing a pathogenic variety of this micrococcus, having a potency, permanent or acquired, greater than that possessed by the same organism in normal buccal secretions.’

“ ‘ The extended researches of Frankel and of Weichselbaum show that this micrococcus is very commonly, if not constantly, present in the exudate of croupous pneumonias, and both of these investigators are inclined to attribute to it a specific pathogenic rôle in connection with the malady in question. Frankel’s first paper was published in 1886. In this paper he says :

“ ‘ Finally, as regards the relative frequency of the two hitherto investigated microbes, in cases of pneumonia, no positive statement can yet be made. Nevertheless, I am inclined to regard the lancet-shaped pneumonia coccus, which is identical with the microbe of sputum-septicæmia, as the more frequent and the usual infectious agent of pneumonia, on the ground that this organism is so much more frequently found in the sputum of pneumonic patients than in that of healthy individuals. This conclusion is further supported by the circumstance that it has not hitherto been possible to isolate directly from the rusty sputum Friedlander’s bacillus.’

“ ‘ Weichselbaum reports that he has found this organism in ninety-four cases of pneumonia, eighty of which were primary and fourteen secondary. On the contrary, he only found Friedlander’s bacillus in nine cases. In three of these cases it was associated with the diplococcus above referred to, and in only three instances was it obtained alone in pure cultures.

“ ‘ Weichselbaum arrives at the conclusion that pneumonia may be induced by several different organisms, but that the diplococcus, which I have called *M. Pasteuri*, a name, by the way, which none of the German authors have been willing to

accept, is by far the most frequent cause of genuine croupous pneumonia.

“ Whatever may be the final conclusion with reference to the specific etiological *rôle* of this or other micro-organisms in pneumonia, we must recognize the importance of secondary causes which control the endemic and epidemic prevalence of the disease, and these have recently been worked out in a very satisfactory manner by a distinguished member of our Association, Dr. Baker, of Michigan.

“ Among the most important investigations of the past year are those of Councilman, of Baltimore, and Osler, of Philadelphia, with reference to the presence of micro-organisms in the blood of malarial-fever patients. Both of these observers confirm the discovery of Laveran, who in 1880 announced, as the result of extended researches made in Algeria, that blood drawn from the finger of such patients during a febrile paroxysm contains a parasitic infusorium, which presents itself in different phases of development, and which in a certain proportion of the cases was observed as an actively motile flagellate organism. Osler and Councilman have found all of the forms described by Laveran, and the last-named observer reports that in recent researches in which blood was obtained directly from the spleen the flagellate form was almost constantly found. Whether the amœboid ‘plasmodium’ found by Marchiafava and Celli, of Rome, represents an early stage in the development of this organism, or whether it simply represents a change in the red blood corpuscles, which occurs also in other diseases, as is claimed by Mosso, has not yet been definitely determined. It is somewhat curious that just when we are receiving satisfactory evidence of the parasite of Laveran in the blood of malarial-fever patients, the bacillus of Klebs and Tomassi-Crudelli, which appeared to be dead and buried, has again been introduced to our notice by the distinguished German botanist, Ferdinand Cohn. In his paper, published in June last, he gives an account of the researches of a young physician named Schiavuzzi, who has made researches in the vicinity of Pola, a malarial region in Istria. The method followed was that of Klebs and Tomassi-Crudelli—viz.: Examination of the air and water in malarial localities and inoculation experiments in rabbits.



“ The bacillus was constantly found in the air, and the rabbits inoculated presented symptoms and pathological lessons believed to be identical with those of malarial-fever in man. I cannot at the present time go into a critical discussion of the evidence presented, but would refer you to an experimental research made by myself in New Orleans in the summer of 1880, in which I repeated the experiments of Klebs and Tomassi-Crudelli, and arrived at the following general conclusions :

“ ‘ Among the organisms found upon the surface of swamp mud, near New Orleans, in the gutters within the city limits, are some which closely resemble, and perhaps are identical with, the bacillus malarix of Klebs and Tomassi-Crudelli ; but there is no satisfactory evidence that these, or any of the other bacterial organisms found in such situations, when injected beneath the skin of a rabbit, give rise to a malarial-fever corresponding with the ordinary paludal fevers to which man is subject.’

“ I see no reason to modify the opinion here expressed, notwithstanding the indorsement given by Cohn to the results announced by Schiavuzzi. These researches relating to organisms in the air and water, and experiments on rabbits, especially in the hands of an inexperienced investigator, cannot have any great scientific value in the elucidation of an etiological problem. The sources of possible error are too numerous, and the method is in any case inadequate for the complete solution of the problem. It is essential that the infectious agent, especially one so easily demonstrated as this bacillus, be proved to be present in the blood or tissues of malarial-fever patients, and in the absence of such proof, experiments on rabbits and researches in the air of malarial regions can have but little weight. It may well be that in the swampy districts of warm climates, where malarial-fevers prevail, one or more species of bacillus will be found in the air or in the water, which are absent from the drier air and running waters of non-malarious uplands, but this is simply an interesting fact in natural history, relating to the distribution of organisms of this class, and by itself cannot be accorded any value in a consideration of the important question of etiology. The method of research pursued by Laveran, by Marchiafava

and Celli, by Councilman, and by Osler, is the true one, and none of these gentlemen have encountered the bacillus of Klebs and Tomassi-Crudelli in their extended researches. On the other hand, they are in accord as to the presence in the blood of a peculiar flagellate organism, and of certain spherical and crescentic bodies, which are believed to represent different stages in the life history of this infusorium. . . .

“The importance attached by the profession to studies of the nature of these referred to is well stated in a recent editorial in the London *Lancet*, relating to the International Hygienic Congress recently assembled at Vienna. The editor says: ‘The Vienna meeting will serve the purpose of indicating the necessity of skilled investigation of the causes of disease, and of encouraging statesmen to rely upon work of this character rather than upon collective opinion.’

“The excellent work which is carried on in the Continental laboratories has undoubtedly had its effect in teaching the value of exact knowledge, but there was none the less too great a desire at Vienna to record by resolution the opinion of numbers, regardless of their fitness to exercise any proper judgment upon the points at issue.

#### OBITUARY.

“Before concluding my address it becomes my sad duty to remind you of the losses which our brotherhood of sanitarians has sustained during the past year, to speak of those whose voice will no more be heard among us, who have joined the great army of the dead. Happily for us, they have left a record behind them of honest endeavor and earnest words spoken in behalf of their fellow-men. Their names are not simply recorded in the list of our members, but also in our hearts; and a permanent record of their contributions to sanitary science will be found in the papers to which their names are attached, which are contained in the volumes of our transactions.

“Unhappily, the list contains the names of several of our most highly esteemed members. As the committee on necrology will make a report for publication in our annual volume, in which the important facts relating to the lives and services of these deceased members will be stated, I shall content

myself at the present time with the mere mention of their names :

“ The Hon. Erastus Brooks died at West New Brighton, Staten Island, N. Y., November 28th, 1886, in the seventy-second year of his age ; Dr. Joseph Gibbons Richardson, Professor of Hygiene in the medical department of the University of Pennsylvania, and member of the Board of Health of Philadelphia, died of apoplexy, in that city, November 13th, 1886, in the fifty-first year of his age ; Dr. John P. Gray, Superintendent of the New York State Lunatic Asylum, at Utica, died, November 29th, 1886, at the asylum in that city.

“ Joseph C. Hutchinson, M.D., LL.D., of Brooklyn, N. Y., died, July 17th, 1887. He was born in Old Franklin, Mo., in 1827.

“ Rev. John D. Beugless, Chaplain in the United States Navy, died at his station on board a Government ship, the Brooklyn, while stationed at some Chinese port, in July, 1887.

“ Dr. Edward W. Germer, a member and ex-President of the Pennsylvania State Board of Health, and Health Officer of the city of Erie for fifteen years, died at his home, August 21st, 1887, aged fifty-four years.

“ Dr. Oscar Fallon Fassett, of St. Albans, Vt., died, July 22d, 1887.

“ Dr. V. H. Taliaferro, Secretary of the Georgia State Board of Health in former years, aged fifty-four years.

“ Nicholas Jones, member of Board of Health, Pittsburg, Pa., died, May 17th, 1887, aged sixty-five years.

“ Dr. William Stephenson Robertson, President of the State Board of Health of Iowa, died at his home in Muscatine, Ia., January 20th, 1887, in the fifty-sixth year of his age.

“ Dr. George Engs, of Newport, R. I., died, July 7th, 1887, of heart disease, aged forty-five.”

The proceedings of the Morning Session of the First Day, after the usual formalities of opening, were the reading of papers on and discussion of the following subjects :

“ THE NECESSITY OF BURIAL PERMITS AND INSPECTION OF THE BODIES OF DECEASED PERSONS,” by CARL H. HORSCH, M.D., of Dover, N. H. It comprehended a sketch of the history and present status of this important feature of

vital statistics to all peoples, and to those of the United States in particular ; and laid special stress upon the necessity of the "Inspection of the Bodies of Deceased Persons" for the following reasons : (1) It is the best safeguard against the possibility of premature burial, and also that the apparently dead may not be placed in cold rooms or on ice and frozen to death. (2) Cases of concealed contagious and infectious diseases will be detected, and epidemics averted. (3) Murder and suicide may be detected, and if cremation (the surest method for the destruction of disease germs) is generally established, there will be also less danger that the body of a murdered person will be cremated, and the crime concealed. (4) Life insurance frauds may be prevented. (5) Where the fear exists of being buried alive, the family physician can overcome that fear by that examination, and his assurance that the loved one is dead. (6) In order to sign a certificate for a burial permit legally, that inspection gives the most important evidence. If a physician gives his signature to such a certificate without seeing the body, he may be brought in the following unpleasant position : He is called into court, the certificate is laid before him, the questions asked, Did you sign that certificate? Answer, yes. Did you know that the person was dead? The only answer could be, the undertaker or somebody informed me. Then the culprit is brought before him and the fact revealed that he indirectly aided a criminal who tried to defraud a life insurance company. The paper closed with citations of the various methods whereby lingering sparks of life in a supposed corpse may be rekindled, and with expressions of gratification that the time had come when State medicine can and does receive increasing attention.

"THE ORIGIN OF SOME DISEASES," and "THE PREVENTION OF MICROPHYTIC DISEASES BY INDIVIDUAL PROPHYLAXIS," two papers, by EZRA M. HUNT, M.D., Secretary State Board of Health, New Jersey. In the first-named of these two papers the author showed how the study of epidemiology had enlarged the number of recognized infectious diseases by a more accurate knowledge of their nature. "The word 'cause,' " he said, "is often in the same sentence used in two or three different senses. In our etiology we must



remember that by 'cause' we mean mostly the 'conditions under which phenomena manifest themselves;' also that these conditions mean the modifying influences present in the host or person, and the modifying influence of surroundings, much oftener than they mean anything in the specific entity which we are so often calling the germ, and then calling it the cause. . . .

"I. There is such a thing as evolution, which, while recognizing an original type, also recognizes departures from the normal which may have come to be so representative and paramount as to constitute newness in all essential particulars. Since we have come to recognize that many diseases are but developments and cultures of microphytic or microbic life, we may very appropriately turn to the facts of botany, not only for illustration, but for verification of our theories. And what a change has taken place in its facts since the days of Linnæus! We no longer cling to the divisions of orders, genera, and species so closely laid down by him. We recognize two forces—nature, or heredity, and environment. A plant inherits a likeness which it tends to retain, but it is often so modified by environment as greatly to change, and so sometimes as even to lose its identity. . . .

"Professor Huxley has recently contributed to the Linnæan Society a paper on the classification of gentians, in which he claims that gentians are all specialized—that is, become gentians from some other form. Permanency of type has so many exceptions, that variations of type, and the power to give fixity to some of these variations by means of cultivation or environment, must be accepted as a doctrine and a fact. . . . It is a law abundantly illustrated in the vegetable world that environment causes variations, and that some of these variations tend to fixity of type, while others do not. All the wonderful facts of evolution show full well that we may in this way have, what in respect of symptoms and treatment is a new disease. Yet it is not a *de novo* origin in an absolute sense, or, if practically *de novo*, it is not *de nihilo*. It is, that a series of changes has been evolved by environment, by conditions in persons or in surroundings until the result of some of these changes becomes self-assertive, and prevails over its heredity so as to secure for a longer or shorter

period a fixity of its own. This fixity may be a new disease.

“ II. The history of hybrids, the so-called accidents of their occurrence, and the *fertility of hybrids*, are such that we are forced to look upon them as new forms of life—as becoming established into an autonomy or individuality of their own. Says a recent botanical authority : ‘ Fertility of hybrid plants is the rule, and sterility the exception. So far as plants are concerned, there is not the slightest ground for considering sterility as a distinctive bar separating species. These hybrids come to have a specificity of their own so different from the parentage as to be unrecognizable, and so specialized as to be permanent. The hybrid becomes an individual not responsible to its species.’

“ Nor is this confined to plants with spores. Some of our most skilful horticulturists are now producing varieties of ferns by hybridism, and every now and then some so-called chance growth or spore shows wide departures.

“ The bearing of all this on the parasitic forms of disease is not far to seek. If, as now seems so nearly proven, so much of disease has so much to do with elementary and minute forms of vegetable life, it is easy to see how the facts of evolution and hybridism have a bearing upon the appearance and propagation of disease. The light of the botanical world and its marvellous revelations as to the actualities and possibilities of the origination of new forms distinct from the parentage, penetrates the hidden sphere of disease origin, and shows how some diseases cease, and how others arise, how some lapse back to their heredity, while others are made permanent or specialized by their environment, and how others still are hybridized into specific forms, and acquire a fertility and fixity of their own. . . . If the views as to the microphytic origin of most of the communicable diseases are correct, the study of the laws of this evolution and hybridism is vital. We believe it is in this direction that we are to account for the origin of new diseases, or for such variations in type as obscure or destroy identity. If we can through this study arrive at the evidence that in this sense many diseases begin, we have a new department of study, in that we are called upon to define with accuracy how and why this origin takes

place, in order that we may thwart or circumvent the conditions. . . .

“ As examples of how proximity of different diseases may modify symptoms, we have many suggestive facts in the history of disease. Yellow-fever is believed by many to be a mongrel, born on the high seas by admixture of the jungle-fever of Africa with the typhus of the pent-up hold of the filthy vessel. It is not certain that typhoid-fever was not once nearer to typhus, until it came to be called abdominal typhus, and then to have modifications because surroundings and acquired power of self-propagation gave it an autonomy of its own.

“ It is not even now certain that there are not grades of cesspool and other adynamic fevers that will some day declare another well-marked departure from what we now call typhoid, and come to have an individuality of their own. It is not certain that when Sydenham treated scarlet-fever and measles as one disease, their lines of difference were as well marked as now.

“ Diphtheria so often seems to have a localized origin, and common forms of sore throat are so often seen to pass away from their general into a special type that it will not be strange if we come to the law of departure. . . .

“ While typho-malarial-fever has no pathognomonic lesion to distinguish it from the ordinary typhoid-fever, yet we do know it has symptoms to distinguish it. The advances of biological investigation have put us in regions of new possibilities that do not involve spontaneous generation, but yet do render probable what is equivalent to the *de novo* origin of cases of disease which afterward are chiefly communicated by the first and succeeding cases. . . .

“ Such a view of the occurrence of old or new diseases and of the reasons for fixity in some and changing forms in types in others, leads to several practical results :

“ 1. The study of parasites, or germs as they are called, is only one of the methods of informing ourselves as to the phenomena of disease, and in itself is not likely to be the key to rational and successful treatment.

“ 2. Our attention should be directed, far more than now, to the study of conditions and circumstances under which new

forms appear ; to the influence of persons and surroundings, instead of the mere finding of a specific form. The latter would, of course, be most valuable as one of the facts in the chain of evidence, but we would not, as now, seek so much to look to it as the cause of disease as to inquire what conditions have caused this or that particular microphyte to be present.

“ 3. We would be able to account for the occasional occurrence of a disease independent of any previous case, and for changing types of disease and new diseases, and would come to treat diseases less by their names and more in view of their type and the effect of surroundings upon them.

“ 4. The tendency of all this is to magnify the importance of close observation, and to lead us to feel that success in warding off disease, and in treating it when it appears, depends mostly upon close observation and that experience which is derived from actual practice.”

In his paper on

“ THE PREVENTION OF DISEASES BY INDIVIDUAL PROPHYLAXIS,” Dr. Hunt took the ground that the experiments and successes of Jenner and Pasteur demonstrated the wisdom of inoculation; and he held it to be also a demonstrated fact that the blood may be so charged with antidotal agents as to give the individual practical immunity against pestilence. He said :

“ With this new evidence I believe the time has come for a thorough testing, both by the practitioner and the biological investigator, of this new method of preventing and controlling disease. There are now many who believe that the real action of some of our most successful remedies is just this : The mitigation or prevention of a microphytic disease does not necessarily mean the destruction of the organism, but its inhibition in loco, or the modification of its chemical action on the tissues or its products so as to render it harmless. It is a part of that antiseptic medication which Professor Yeo, Professor Brunton, and many others recognize as steadily gaining ground for approval.

“ If in an individual case of exposure, or an outbreak in a family or neighborhood, this kind of prophylaxis is available, it is easy to forecast the wonderful beneficence of the result.



If, for instance, in an outbreak of diphtheria in a family, or in a neighborhood, we can put all persons exposed for a few days upon a prophylactic treatment, or if in the first outbreak of cholera in a locality all exposed persons can be rapidly brought under the inhibitive effect of a prophylactic administered promptly and cautiously, we will have in our possession a mode for the limitation or prevention of epidemics far more likely to have practical application than any system which involves the cutting of the skin or the introduction in any form of the actual virus of the disease. At any rate, with two such modes of defence at hand, we might hopefully expect to substitute the word sporadic for epidemic, and to bring many a vagrant pestilence within the range of our control. The present age of advancing medical art will be rendered still more notable if it can be found that simple and active medication on the outbreak of any communicable disease will protect all those exposed thereto from the contagion, or so modify its effect as to make the attack benign."

In the discussion which followed the reading of these papers, Dr. BRODIE, of Michigan, said: "The first paper, read by my friend, Dr. Hunt, has very much interested me. Its interest lies in the fact of the want of knowledge of the causation of disease. If we could understand the cause of disease, I think what might follow in reference to its prophylaxis and treatment would be very easy. It is very difficult, when scarlet-fever or small-pox breaks out in the community, to know where it comes from and its causes. I have always held the doctrine that there was always a first cause, of course; but I can conceive where scarlet-fever or diphtheria may break out in a community without necessarily being carried by contact. I have always believed strongly in the influence of atmosphere, accompanied by local and other conditions, in the production of disease, and I believe that circumstances may arise under which scarlet-fever occurs in a community without contagion with any other town, place, or individual. I cannot explain to you how I arrive at this conclusion, or give the facts that make me think so; but yet, on observation, not only of my own, but of other gentlemen, distinguished gentlemen, in years gone by, I have held that to be the case. This paper points to very much the same conclusion, and rather

pleases me, because it conveys the idea that I just stated, about the origin of diseases. We may have, for instance, typhoid-fever. Now, in Michigan, my friend, Dr. Baker, and many others disagree with me, and put down a certain class of diseases as typhoid-fever. I have not seen any typhoid-fever in Michigan for the last ten or fifteen years—what I call typhoid-fever. The disease there called typhoid fever, lacks a great many of the conditions of typhoid-fever as described by Bartlett and Louis, and according to my own observation; yet contains and retains several of the same conditions. Hence I think it's a misnomer when a disease is called by the name of the original disease, and I think it misleads the people and has a bad effect on sanitation to so consider it."

Dr. A. N. BELL, of New York, remarked, with regard to the hybridism of yellow-fever, as suggested by Dr. Hunt in his first paper, of all the diseases he had ever encountered—and he had seen a good deal of it in the United States, Mexico, South America, the West Indies, on the coast of Africa, and on board ship—he knew of no disease which possessed a greater uniformity of pathognomonic symptoms. Moreover, all of the history of that disease he had ever read, and his reading of it had been somewhat extensive, demonstrated its unmistakable identity from first to last, without any evidence whatever of change of type or hybridism.

Of the second paper, Dr. Bell said: "More than thirty years ago, when I was in conflict with pernicious-fever and other malarial diseases in localities particularly fruitful in such affections, I demonstrated to my entire satisfaction the worse than useless effect of quinine, arsenic, or anything else at my command, taken in health, as preventives. I became fully satisfied, and have remained so ever since, that the susceptibility to disease is increased by the practice. And I have recently had my conclusions strengthened in this regard by the practical experience of one of the most accomplished medical practitioners I know—Dr. Charles H. Williamson, formerly of the United States Navy, now resident physician of the Pacific Mail Steamship Company at Panama—I inquired of him in particular with regard to the great mortality among the operatives of the Panama Canal Company. His reply was: 'It is caused by quinine and whiskey. There are some, however,

who omit the whiskey, but they are so fully imbued with the notion that quinine is a preventive of malarial-fever that the exceptions to its use are very few.' To the explicit inquiry whether, during his three years' continuous residence in Panama, he had ever taken quinine or anything else as a preventive, he replied, 'Never; that he had not been sick during the while, and other persons who had lived as he had, who had taken no prophylactics except good care of themselves, were the healthy people in that climate.' My own observations in tropical America and Africa," Dr. Bell added, "are fully confirmed by Dr. Williamson's, and nothing that Dr. Hunt has advanced, or the writers he has quoted, tends in the least to shake my conviction of the mischievous effects of well people taking medicine under any circumstances."

Dr. C. N. HEWITT, of Minnesota, said: "I, for one, should be very happy, as the executive officer of a State Board of Health which had a great deal to do with dealing with this matter, if I could believe that we had got far enough along yet to suggest a specific prophylaxis for disease. My office is full of suggestions of that sort. We have several remedies in which the basis is turpentine, which bring in a large income to their venders. Our arrangements are such that all reports come to our office, and there is hardly a report in which the belief that there is such a thing as taking medicine while you are well to keep from getting sick, has not proven a bar to our progress; the belief that you can take a little dose of something beforehand and needn't take the disease at all. I remember a few years ago when we had the largest outbreak of small-pox in Sterns County. It was a thinly-settled county and no physicians practising there; they believed in specifics that had something in them that prevented the occurrence of the trouble; and therefore they didn't any of them think they had small-pox until over a hundred cases had occurred, and when I got there I found ten or fifteen townships permeated with the poison, and all the intelligent men believed that a one-millionth solution, touched to the tongue of a visitor, was sufficient to prevent the spread of the disease. One of the strongest bars, I tell you—and I speak from an experience of twenty years as the Health Officer of our State—one of the strongest bars we have to meet, is the belief that we or some-



body else can provide people with a specific which does away with all necessity for cleanliness, or anything in the shape of common sense. I do not wish it to be understood that I do not yearn, just as heartily as my friend Dr. Hunt, and all other executive officers, for something that would enable us to deal with disease in that way ; but we must be very careful, indeed, especially with respect to that damnable disorder, diphtheria. It is this disease of all diseases that is dealt with by specifics—that can be prevented by something in contact with the visible sign of it. It is the disease of all diseases that can not be dealt with in any such way ! We have two works to do, and we must distinctly differentiate the two. The first of those works is ideal, the hope, the anticipation, the expectation of the future. That is what sustains us. If we did not have the expectation that we should do better and be better hereafter, there would be a good deal of despair ; it is just such anticipation that encourages and sustains us in our every hour of work, but we must not carry the one too far into the territory of the other. I believe heartily in the pursuit of the one as I do in the practice of the other ; and when the pursuit of the one shall put into our hands a tangible means for use in the other, I say, ‘ God be thanked, and let us try again ! ’ ”

Dr. H. B. BAKER, of Michigan, said : “ I wish to indorse what Dr. Hewitt has said, very strongly. I think we are all indebted to Dr. Hunt for his able paper, and the hypothesis is very interesting, but I cannot go the length of my friend, Dr. Brodie, in making that a working hypothesis. I think we must draw the line there. It is following that hypothesis of the *de novo* origin of disease that has given us a thousand deaths from typhoid-fever in our State in a year. That is what we get from acting on it as a working hypothesis. We ought not to work on that line at all, but the reverse ; find where the disease came from ; find where it is likely to come from, and teach the people how to prevent it, and in that way we are doing some work in Michigan, as they are in Minnesota, in preventing diphtheria and scarlet-fever and typhoid-fever. I can understand why they do not have typhoid-fever in Detroit, where Dr. Brodie comes from—they have a good water supply ; and we can get a good supply if we will not teach the *de novo* origin of typhoid-fever, but teach



that it is usually traced to bad water. The working hypothesis we have now is a useful one, and that given to us by our friend here may be useful some time in the future. But I think we should not take it up and work on it to-day ; it is what we have been doing in the past.

“ When people think that diseases like typhoid-fever and diphtheria come to them from an unknown source, they do nothing ; but when we teach them they can isolate their cases and disinfect and save hundreds of lives a year, I think we ought to continue in the same line.”

Dr. BAILY, of Louisville, Ky., said : “ There is so much of this subject I know so little about, I will not speak very long. First, in regard to the fertility of hybrids. This may be so—what Dr. Hunt states—in regard to the lower forms of animal and vegetable life, but if it is so in full, then I shall go home and advise my neighbors to raise colts from their mules, which they have not been able to do heretofore.

“ I want to say that I admire exceedingly the tendency of the paper. It is seeking after what we want, where frequently we are unable to determine intelligently, and reasoning by analogy, even from this inferior order of fertility, hoping to gain a specific organism by development, that will account for diseases not heretofore accounted for, and also for the influence of environment in cases *de novo*. I think Dr. Bell can tell us something of the influence of environment. But I want to say that I think Dr. Hunt possibly may have gone beyond really his own convictions, seeking after something he hopes may be true, and in that way, eventually, good may come out of it. I am pleased with the paper.”

The fallacy of the hypothesis was cogently disposed of by the President, Dr. STERNBERG, who remarked that the reproduction of microphytes was by *fission*—a process of reproduction which does not admit of comparison or illustration by analogy with the reproduction and hybridism of organisms of a higher order.

Dr. Hunt said, in closing the discussion : “ I should have been exceedingly disappointed if this paper had not called out some discussion ; and I thought in proposing the subject of the paper, I was very careful not to commit myself to any theory. I entertain a hypothesis a great while before I con-

vert it into a theory. As to the first paper, one point has been entirely overlooked—that of the suggestion of the change that takes place in disease by evolution, and the whole attention seems to have fastened upon the question of the fertility of hybrids. I was quite aware that because there are mules and multitudes of physicians and men that know more about mules than they do about the infinitesimal botany of disease, that proposition would be disputed.

“ When preparinfi this paper, I first wrote to Professor Asa Gray. He was out of the country. I then went to Professor McCloskey, of Princeton, and spent a day with him and got his opinions. I then went to Professor Epgar and submitted to him what was said on the subject of hybrids ; and I then went to Mr. Mahon, the editor of a monthly of Philadelphia, and who, I was told in New York, was an excellent authority upon that point, and what I said on all the three points is in quotation marks from those three gentlemen, so that I do not propose to discuss the question as to whether hybrids are fertile. I knew it would bring out a difference of view, and in looking to my manuscript, I see that I say, ‘ but so numerous are the exceptions, and so abundant have been the results of new cultivation, that the view that most hybrids are sterile is fully disproved.’ That is true. That does not mean to say that all hybrids are fertile ; but it does mean to say that non-fertility among hybrids is the exception ; fertility among hybrids is the rule ; and I inquired definitely into the fixity of the fertility, and find that many of the hybrids do come to be fixed in their fertility. Next, as to the danger of the *de novo* origin of disease. Now, sir, it is always dangerous to fasten too much upon one idea. There are two parallel bars on which the progress of sanitation runs as much as the rear car on a railroad. One is isolation ; if I ever should say anything in a paper that would lead to a want of caution, I should be sorry ; but I should also be sorry if I were not teaching that filthy surroundings, the condition of the person, may propagate disease, and sometimes there is a possibility that they may result in the origin of diseases. I know this about diphtheria and scarlet-fever and about typhoid-fever that makes me not ashamed, that Murchison believed that it is of *de novo* origin, in the sense in which evolution and hybridism may

come to explain the thing, and therefore let it be understood only as an hypothesis. But it is my business to set myself to thinking and my brethren to thinking in right directions. That is all I have attempted to do. I have not accepted a theory, nor do I want you to accept it, but I do want these propositions to elicit your kind attention.

"As to the other point, prophylaxis: Is there any disagreement that we do not want men and women and children running up and down the country with all sorts of nostrums as antidotes for disease? But does that prove when I am going into a malarial district, it is bad for me to take small doses of quinine without whiskey? For three years the Government of Great Britain has kept Dr. Cash at work, and the experiments made show the beneficial effects of the prophylactic treatment. And shall we not accept such pieces of proof, even if they are little pieces; shall they not put us on the *qui vive* to be after these things, not accepting them as proven, but as possible facts that are well worthy of our attention? That is all I have to say."

#### Report of committee on

"SOME FORMS OF TABLES OF VITAL STATISTICS, WITH SPECIAL REFERENCE TO THE NEEDS OF THE HEALTH DEPARTMENT OF A CITY," by JOHN S. BILLINGS, M.D., Surgeon United States Army, was submitted, and in part read by Dr. H. P. WALCOTT. It was chiefly statistical, and covered a large field of inquiry.

"REPORT OF THE COMMITTEE ON DISINFECTANTS" was submitted and read, in abstract, by Dr. GEORGE H. ROHÉ, Secretary of the Committee. It appeared to be exhaustive, and the Committee asked to be discharged.

The results with regard to the efficiency of heat as a disinfectant were summed up as follows:

"The temperature required to destroy the vitality of pathogenic organisms varies for different organisms.

"In the absence of spores, the limits of variations are about 18° F.

"A temperature of 132.8° F. is fatal to the bacillus of anthrax, the bacillus of typhoid-fever, the bacillus of glanders, the spirillum of Asiatic cholera, the erysipelas coccus, to virus

of vaccinia, of rinderpest, of sheep-pox, and probably of several other infectious diseases.

"A temperature of  $143.6^{\circ}$  F. is fatal to all the pathogenic and non-pathogenic organisms tested, in the absence of spores (with the single exception of *Sarcina lutea*, which, in one experiment, grew after exposure to this temperature).

"A temperature of  $212^{\circ}$  F. maintained for five minutes destroys the spores of all pathogenic organisms tested.

"It is probable that some of the bacilli which are destroyed by a temperature of  $140^{\circ}$  F. form endogenous spores, which are also destroyed at this temperature."

Dr. A. N. BELL remarked, on the conclusion of Dr. Rohé, that, at the risk of its being considered vanity on his part, he could not forego the opportunity to express his gratification at the results of laboratory work, during recent years, in demonstrating the efficiency of heat in destroying the vitality of disease germs *per se*, at very nearly the same temperature which he had claimed and published (in the Proceedings of the Medical Society of New York) twenty-three years ago—namely, that a temperature of  $145^{\circ}$  F. effectually disinfects the worst fomites, and which he had repeatedly demonstrated, approximately, during the preceding twenty-six years in and since 1848.

The first paper on the second day was on

"THE NECESSITY OF INSPECTION OF ANIMALS REQUIRED FOR FOOD," by CARL H. HORSCH, M.D., of Dover, N. H. Dr. Horsch not being present, the paper was read by Dr. George H. Rohé. The paper cited the laws of Moses regarding the killing of animals. And the deleterious effects arising from eating meat of animals which had not been properly slaughtered, and which were evidently diseased, was commented upon at length. The paper concluded by recommending that proper and competent persons should be appointed to inspect animals before they were slaughtered, and that a close examination of the internal organs be made afterward.

Dr. AZEL AMES, of Chicago, read a paper on

"THE MEAT FOOD SUPPLY OF THE NATION." "Closely related to the welfare of the nation and to its food products," he said, "lie the questions of the export trade and transporta-



tion traffic, through which much of our wealth and attendant advantages are assured. No reliable census of the animal wealth of the country has ever been taken, but however great it may have been, it has been seriously decreased in the past two years by terrible inroads of disease and losses of the herds of the southwest and northwest from severe droughts and winter hardships. Almost unconsciously, but nevertheless with great rapidity, we are approaching those conditions as between population and food supply which are the chief anxieties of European nations. The problems of the old world are fast becoming ours. So rapid has been the advance of our population, and so great the losses to our herds, that there are to-day undoubtedly less than 700 head to the 1000 of population as compared with 814 head in 1860. We consume to-day 150 pounds of meat per capita against 111 in 1860, and in Great Britain it has increased from 77 pounds per capita to 109 pounds since 1860. America makes good to-day the deficiency of the meat supply of Western Europe by an astonishing total of 800,000 tons. It is evident that our meat supply is rapidly diminishing from these natural causes—viz.: The enormous increase of population and its consumption, the diminishing grazing area, and the increased cost of production. But aside from these national influences, two that are distinctly abnormal threaten and depress the industries which produce flesh food: the first is disease, and the second is the old and new enactment of Congress and State Legislatures. Pleuro-pneumonia, which is merely exotic in its character, has in the past five years inflicted a direct loss on the country of between \$20,000,000 and \$30,000,000. The Consolidated Cattle Association has made steadfast war on the disease, and with the assistance of this Association the Bureau of Animal Industry has secured from Congress much help in its aid. They have urged the appointment of a commissioner by the President, and appropriations from Congress to enable him to get at the prime causes of this dread disease, and to provide means for its eradication. It is the duty of the National Government to take this matter in hand, for it virtually interests the whole people, and the next general census should include full and complete data on the subject."

He concluded with a strong denunciation of the Act of

Congress restricting the manufacture and use of oleomargarine for the benefit of a privileged class—the dairymen—to the almost exclusion of a food everywhere pronounced wholesome by competent analysts, and eminently suited by both cost and excellence to the necessities of the wage class, who can ill afford to pay the extra cost of butter, which is no better, thus protected.

“CHOLERA AND QUARANTINE” was the title of the next paper, by Dr. JOHN H. RAUCH, Secretary of the Illinois State Board of Health. He first alluded to the yellow-fever epidemics, which had been so successfully prevented during recent years by the efficient quarantine system of Louisiana, and expressed his belief in its equal efficiency against cholera. With regard to imperfect systems of quarantine, he believed, with John Simon, they were worse than no quarantines at all. Excepting the one referred to, that of the Mississippi, he regretted to say of the present state of the quarantines of this country, and that of New York in particular, it was such, in the at present menacing attitude of cholera, as to be a source of the greatest concern to the health authorities throughout the country. He dwelt especially upon the deficiencies of the New York establishment, and referred to the very unsatisfactory correspondence between himself and the Health Officer of New York with regard to the danger of introducing cholera through that port by means of the recent arrival of cholera-infected ships, and the protracted continuance of cholera among the detained immigrants. He read the report of the Philadelphia committee, and two circular letters which he had recently published, officially, and sent copies of it to the New York Quarantine Commissioners and to the leading railway companies, invoking such additional measures by all concerned as would give better promise of security against the introduction of cholera into the country than that which, so far as he had been able to learn, now obtains at New York.

Dr. F. Montizambert, Quarantine Officer of Quebec, described the additional stringent regulations put in force at his station on account of the recent danger by the arrivals at New York, and the published accounts of the deficiencies at that port. Every vessel from a port outside of Canada is required

to have the quarantine officer's certificate before a landing can be made. A regulation concerning hospital cabins on board ship had been reasonably well carried out. Protection from small-pox was required of steerage passengers either by an attack from the disease or by vaccination or re-vaccination within seven years. He advocated the same rule with regard to cabin passengers. The whole expense of Canadian quarantine service is borne by the Government of the Dominion, which has entire control of it.

Dr. A. N. BELL said in substance: "I have an excuse, though I require no apology to this Association for appearing here with what ought to have been, and could it have been a month later would have been, the substance of a carefully written paper. During the last month, ending at about three o'clock on Friday, November 4th, the day before I left home, I have spent a considerable portion of my time at the New York quarantine, assisting the health officer in the destruction of cholera there. Permit me to state, however, at the outset [addressing the President], in reference to your own sentiment yesterday, that the quarantine expenses should be paid by the people protected, I decidedly dissent, and I will give you a reason, with an example, before I get through with my remarks for my dissension. For the rest, it seems almost unnecessary for me to remark in reply to the last speaker, that the quarantine establishment of the St. Lawrence, the facility with which it can be controlled, and the success of its efforts as compared with the quarantine establishment of New York, when we consider the relative commerce and the relative danger of importing disease into this country, the two are scarcely comparable. But this is not a new question to me; it was my experience before another association (the American Medical), as long ago as 1866, when in the face of cholera, to be engaged in an effort, begun seven years before, to establish a national quarantine, to take exception to a plan submitted by Dr. Marsden of Quebec, which he wished the Association to adopt. I regarded it as unnecessarily obstructive to commerce for the port of New York, and was, perhaps, instrumental in rejecting it by the medical association.

"I fully agree with Dr. Rauch in that a quarantine not properly equipped is worse than none at all, whether in New

York or elsewhere ; that a properly equipped quarantine will prevent cholera as effectually as yellow-fever. Moreover, I believe that the New York quarantine, in its conception, arrangement, and contemplated equipment, under that spur only by which sanitarians can make progress, when epidemics strike the community, is in its design one of the most complete establishments in the world. But it has never been equipped, and we should make the present occasion a means of appealing not only to the national, but to every State Government for effective quarantines at every seaport of the country. The New York quarantine establishment, as it now exists, was begun under the spur of a limited epidemic of yellow-fever along Bay Ridge and at Fort Hamilton, first by the destruction of the worse than useless quarantine which previously existed at New York, and had it been completed as designed and kept in condition there would have been no such embarrassments as those which now obtain.

“The New York quarantine, virtually, consists of four parts. There are two artificial islands in the lower bay, about two miles distant from the shore on either side, and about one mile apart. One is called Swinburne Hospital Island, on account of the hospitals that were erected there during Dr. Swinburne’s administration as health officer in 1866-70, and the other one, Hoffman Island, in honor of the governor by that name, a refuge station for the well from infected vessels during the period of incubation, and to admit of the cleansing of vessels as soon as possible in the promotion of commerce. The health officer’s residence is on Staten Island, at a point where he can overlook the establishment, and opposite his residence, in the Narrows, is the upper boarding station. The fourth part is a floating hospital ship, anchored in the lower bay during the summer below Hospital Island, used also to facilitate commerce by the prompt boarding of all infected ships before permitting them to go further up.”

The President : “Was that ship in the lower bay this summer ?”

Dr. Bell : “You will hear about it presently. The pilots have instructions from the health officer that when any ship has an infectious disease on board, she must come to anchor in the lower bay. But there was no hospital ship in the lower



bay this year ; she lays rotting on a mud flat at Red Hook, Brooklyn. That ship I superintended the fitting of fifteen years ago, during her last repairs ; she will no longer float.

“ Now, of other conditions : The Swinburne Hospital was at about the same time, fifteen years ago, equipped in every particular. And I do not think I was ever so much abused for anything I had a hand in (I was commissioner of quarantine at the time), as I was for insisting upon the equipment of that hospital, particularly for having provided a condenser for making ten thousand gallons of fresh water daily. The hospital is now and has ever since been kept in good condition. Among other things was a steaming apparatus for disinfecting the soiled clothing and bedding of all the sick of the hospitals.

I went out of office as quarantine commissioner about six months after Dr. Vanderpoel was made health officer, in 1873. We acted in concert with regard to the requirements of Hoffman Island, but by this time that epidemic spur and a succeeding one of cholera, under which the buildings were begun and had been thus far constructed, had subsided. The people and the Legislature had become lukewarm ; and further appropriation for finishing the work was refused.

“ On Hoffman Island three buildings had been erected : two large ones for detaining passengers and one administrative building. They had been furnished with a good heating apparatus, a cooking galley sufficient for one thousand people, and a steam pump connected with the heating apparatus. A little plumbing was subsequently added, alike despicable in its arrangement and construction. .

“ The islands are constructed of what is called crib-work. Swinburne Hospital Island was begun in seven feet of water ; Hoffman Island in eleven feet. This, the larger one of the two, comprises a little less than three acres. The outer area, all around, consists of broken stone, and on the inner side of this a beton wall four feet thick. And next to the beton wall a circle of flooring beams twenty feet wide covered with two-inch plank was laid. This, bear in mind, was done fifteen years ago. And those who thought they knew more about such matters than the health officer and quarantine commissioners concluded enough had been done.

“ Seven years ago the present officials were appointed under

a different executive administration from that which now exists in the State. They are 'hold-overs' under the privilege of the State Senate to withhold confirmation of the governor's nominations for substitutes. The health officer, however, is in immediate connection with the other health authorities of the State. That is to say, he is ex-officio member of the State Board of Health, and ex-officio member of the Health Department of the city of New York; and besides, he consults the health commissioner of Brooklyn before sending up such ships as the *Alesia*. He has, therefore, the benefit of counsel with the health authorities of the State and of New York and Brooklyn, though he is not subject to it. In 1884 the health officer, realizing the danger of cholera and the decayed condition of the woodwork, to which reference has been made, the beams and planking being reduced to a mere mass of rotten wood, mingled with the sand filling, invited a special meeting of the State Board of Health and of the city health authorities, with the quarantine officers, to consider and to urge upon the Legislature needful appropriation for repairs. Appropriations were provided for in the supply bill and passed by the Legislature, but the measure was vetoed by the executive for reasons, doubtless, satisfactory from his point of view; but this action is urged by the quarantine authorities in excuse for the present disgraceful condition which exists.

"The health officer, I know, has been exceedingly solicitous with regard to this inefficient condition, and up to the time of the arrival of the *Alesia*, with cholera, he was certainly uneasy as to the possibility of using the means at hand successfully in the event of such an arrival.

"The *Alesia* arrived on the 23d day of September. The boarding officer reported that she was filthy in the extreme; six deaths had occurred on the voyage, four of which were unquestionably of cholera, and eight passengers were sick with that disease at the time of her arrival. The sick were immediately transferred to the hospital, and the well were sent to Hoffman Island. A police of twelve persons was chosen by the health officer from among them who could speak English, and under my own observation they appeared to be very vigilant in their duties. Among the first acts of the health officer was to have the water pumped out of the cistern most distant

from the quarters of the immigrants, and the cistern thoroughly scoured. (Both of these islands are provided with large cisterns for catching rain-water from the roofs of the buildings.) He then had the cleansed cistern kept filled with the Croton from New York, and placed a policeman over it all the time for dealing out drinking-water and preventing the immigrants from dipping their cups into it. Plumbers were ordered there to make repairs as rapidly as possible, and to put new water-closets in the place of the old and worthless ones. A number of bath-tubs were extemporized by cutting hogsheads in two and using them as such. Meanwhile the Alesia was being disinfected by means of burning sulphur and the free use of mercuric bichloride. No disinfecting apparatus of any kind was or ever had been in the Hoffman Island buildings up to this time. The health officer ordered two large 'boxes,' twenty feet long, twelve feet wide, and twelve feet high, erected in one of the buildings as disinfecting chambers, by sulphur fumigation. His purpose was to have all clothing and baggage placed in these boxes and exposed to the fumes of burning sulphur, three pounds to every one thousand cubic feet of space. It hardly need be said that this process could be gone through with but once daily, on account of the persistence of the fumes preventing renewal; and, moreover, the vapor so escaped as to make the building well-nigh untenable. Realizing the slowness of this process, he next had the steaming tub that was made for disinfecting clothing at the hospital removed to Hoffman Island, connected with the boiler of the engine there, and put into use. This tub is oval-shape, only five by four feet, and four feet deep—so small that with the utmost use the clothing of five hundred immigrants could not be passed through it in less than a week. Meanwhile, cases of cholera continued to occur among the inmates every few days. Under these circumstances Dr. Smith invited my assistance. I suggested at once: 'You will never get through with these people until every one of them susceptible to the disease takes it, unless you disinfect everything in one day.' He entrusted the effort to me to procure the means by which this could be done. After a week's effort I procured a box ready made for steam purposes, six feet in length and five feet each of the other dimensions, with a door of the whole dimen-



sions of one end. I was told it would stand twenty-five pounds pressure. It was ordered to be sent to quarantine, but on the same day I received a communication from Dr. Smith, suggesting that it first be sent to the *Britannia*. I replied, 'Certainly not ; steam the clothing of the *Britannia* and the ship in position ; make a receptacle of her own steerage ; put all the clothing and baggage of all on board into the steerage, and steam the steerage with her own engine.' She had had three cases of cholera since her arrival, three or four days before, and with a so-called medical officer, who said there had been only one death on board during the voyage, and that was a case of perforation of the intestines by *lumbricoides*. That report was sufficient to send the *Britannia* to the lower bay. The vessel and clothing was disinfected by means of steam in the manner suggested, and the next day all the passengers were required to change their clothing, put on that which had been steamed, and that which they removed from their persons was put through the same steaming process. Subsequent to which time there was not a case of cholera on board or among her passengers after they were removed. Meanwhile, the steam box was in process of fitting for the *Alesia's* passengers on the island, and I had opportunity to observe the necessity for the utmost vigilance of the watchmen with regard to the use and cleansing of the water-closets—the floors of which were kept constantly wet and the closets frequently flushed with the mercuric bi-chloride solution—and the filthy habits of many, despite the vigilance of the watchmen, in making their alvine deposits round about. The feeling among these people was evidently the same as it is said to have been among the Italians at home during the prevalence of cholera among them—afraid of the doctors, and, consequently, using every means in their power to avoid them by concealing the evidences of the disease. I stood myself day after day with Dr. Smith, having these people pass between us and carefully examining every one. Notwithstanding, cases of children escaped us, because they could not be detected until they were on the verge of collapse—their mothers concealing the premonitory symptoms and secreting the diapers among the clothing to prevent discovery.

“The steam-box being ready, from previous practical



knowledge of the use of steam as a disinfectant, I deduced the conclusion that steam under seven and a half pounds pressure would sustain the desired temperature of  $230^{\circ}$  F. for rapid disinfection, provided it be introduced under high pressure. An escape valve at seven and a half pounds pressure was provided at the top of the box. The box was then filled with baggage on wooden gratings, avoiding contact of the clothing with the sides; a registering thermometer was put in, the door closed, and steam turned on from a boiler under sixty pounds pressure. The escape valve was sprung in less than one minute. At the end of fifteen minutes steam was shut off and the door opened; the thermometer registered  $230^{\circ}$ . The same process was gone through with under my own supervision several times with the same result— $230^{\circ}$  to  $232^{\circ}$  every time. The apparatus was then, by Dr. Smith's order, transferred to an intelligent engineer, with directions to extend the time to twenty minutes each charge, with the same directions with regard to initial temperature under sixty pounds pressure. In less than twelve hours all the baggage of all the immigrants was passed through this process. On the next day they were all required to change their clothing, wash themselves thoroughly, and put on clothing that had been steamed the day before. There had not been, up to the time of my leaving home, during an interval of three weeks, a case of cholera among them since.

“Two days after this steaming I attended a conference of the joint Boards of Health of New York and Brooklyn with Dr. Smith, and expressed my opinion that those people and their baggage could be discharged without danger to anybody.

“Commissioner Bryant, of the Board of Health of New York, after asking me the question, ‘Considering what you have described to be the condition of Hoffman Island—the accumulation of rotten wood mixed with the sand and its befoulment—despite the watching, considering all the circumstances, would you be willing that your family should risk going to Hoffman Island, supposing there was some occasion for it?’ I replied yes; for admitting there were alvine deposits on that island, so thoroughly exposed as it is to the sun, and knowing as I do that the water has been perfectly protected, I should not deem it dangerous in the least. He said, ‘Nevertheless, I

object to those people coming to New York until some intermediate place, long enough to cover the period of incubation, be provided for them.' I assented: 'Very well, it is right that you should protect the public health to the utmost limit.' The decision was quickly acted upon, and, on my suggestion, measures were at once taken by the quarantine authorities to obtain a ship suitable for the purpose, to be anchored in the lower bay, and within two days one was obtained. I saw all those people on board on the day before I left home. Immediately on their transfer from Hoffman Island, all of the immigrants on board the *Britannia* took their place for detention and for the same measures of baggage disinfection again, notwithstanding that which had been applied in the steerage, though there had not been a single case of cholera among them since.

"A very singular thing, however, occurred: scarcely had the disinfecting process been gotten through with when an epidemic of measles broke out among the *Britannia's* passengers. I saw fifteen cases in the hospital the morning I was among them—the day before I left home—some of whom, I think, will die. The rumor that these cases were cholera, falsely reported, I know to be absolutely untrue.

"I have before remarked that contrasts in quarantine service are profitable lessons. The *Alesia*, on arrival, was abominably filthy, and doubtless had been so during the voyage. The heavy expense incurred by her owners for her treatment and of her passengers in quarantine is a just penalty for their disregard of properly qualified sanitary officers, and for receiving immigrants for transportation without regard to whence they come or the condition of their effects, and their total disregard of the danger of introducing cholera into this country by such means.

"Meanwhile another emigrant ship arrived from the same port, the *Independente*. On board of her there was an intelligent medical and sanitary officer. He had, from the time he left Naples, paid due attention to the cleanliness of the ship, and had, doubtless, also to the emigrants on their reception. All the clothing and bedding was aerated daily during the voyage. The ship arrived in admirable condition—everybody on board well, and without having had any sickness on

the voyage. There being no reason for detaining such a ship or any person belonging to her, she was, after careful inspection, promptly admitted to pratique, and her passengers, after the disinfection of their baggage, were permitted to proceed. Yet the health officer's action in this case has been severely criticised by persons not acquainted with the facts.

"From my recent intercourse with the health officer of New York, I am satisfied he feels that, with the extemporized means now at his disposal, he is confident in his ability to deal successfully with any possible recurrence, such as that of Alesia, from Naples or elsewhere. But he fully concurs with me in the opinion that the means which have thus been extemporized are anything but mere temporary makeshifts, the best that could be supplied in the time under existing circumstances.

"I have already spoken longer than I intended, and taken up too much time, but permit me to say in conclusion, I am no apologist for the disgraceful condition of the New York quarantine establishment long before and at the time of the arrival of the Alesia. I have endeavored to describe it as it is, and I sincerely hope for the full strength of this Association, as well as any other assistance that can be had, to promote its thorough repair and equipment."

Dr. Falligant: "I do not feel, as a member of the Association, that any assistance could be given to our good work by placing it in antagonism with the executive and legal authorities of any State. Dr. Bell made a statement somewhat to this effect, that the executive of the State of New York was responsible for this state of the New York quarantine, which he described as disgraceful; and if this Association is prepared to endorse a statement of that kind, or to let that remark go just so, and throw the responsibility upon the executive, then we are simply putting our Association in a partisan position. I don't care what may be the partisan feeling of one man or another—if the devil will come and help us with good work, I'll catch him by the tail. Dr. Bell's statement was that the Governor of New York was responsible. The statement of the Governor was so entirely different, that I am very much surprised at the statement of Dr. Bell; and the Governor's statement was so thoroughly in harmony with the expression

of views of almost every member who has expressed himself, that I am compelled to call it up, because it certainly appears to be in harmony with the views of the Association. Governor Hill stated in his veto, that an enormous amount of fees was collected from the commerce of New York, which he considered perfectly sufficient, if applied in a proper and legitimate way, and not absorbed by salaries and purposes not proper to quarantine, to provide New York magnificently. It was entirely in harmony with economy and good government, perfectly appropriate; just exactly as we do in Savannah, and this Association has nothing to do with the manner of obtaining money to equip that quarantine."

Dr. Bell: "Dr. Falligant wholly misconstrues my words with regard to the responsibility for the disgraceful condition of the quarantine, which I have endeavored to describe with due respect for all concerned, but without fear or favor. I have used no such words as he imputes to me, nor any susceptible of such a construction. His suggestion for the application of the health officer's fees for repairs, etc., is due to his ignorance of the subject. The fees of the office are allowed by law, and the payment of deputies and running expenses is required of the health officer. For any negligence in this respect, the health officer is certainly the responsible party, but not for the construction and repairs of the establishment—these belong to the State.

Dr. William Oldright, representative of the Ontario Province Board of Health, presented resolutions from that board, asking the Association to take notice that the rumors of cases of cholera at New York quarantine had been reported as measles and that baggage had been passed uninspected by the quarantine officers. He asked if the pledges made by health authorities in the conferences of boards of health concerning the notification of the existence of contagious diseases had been kept.

He offered the following resolution:

*"Resolved*, That this Association would press upon the attention of railroad, national, State, provincial, and local health authorities the absolute necessity of abolishing the present system of scattering excreta along the railroad tracks, and of substituting therefor some method whereby the excreta



can be completely and frequently moved from the trains and tracks and safely and properly disposed of on sanitary principles."

The resolution was referred to the Executive Committee.

Dr. Bell, in reply to a question, said that, so far as he knew, no action whatever had been taken on the subject of cholera by the New York State Board of Health. But with regard to the sensational newspaper reports that cholera had been reported as measles at the New York quarantine, referred to by Dr. Oldright, he would only emphasize what he had before stated, basing his knowledge on a good many years' practical experience, frequent opportunities, and diligent study of those diseases, he felt himself fully justified in making the most positive contradiction of the said reports. Measles had broken out recently among the Britannia's passengers more than two weeks subsequent to the last case of cholera—of which disease there had been but two certain and one doubtful cases among that ship's passengers. He had seen the cases of measles in the quarantine hospital. They were measles, and nothing else, beyond the shadow of a doubt.

Dr. J. F. McCormack, Secretary of Kentucky State Board of Health, said that every State except New York had carried out the Interstate notification of diseases.

Dr. L. F. Saloman, of New Orleans, said the condition of the quarantine service of New York was astonishing. He spoke of the rules on the lower Mississippi.

Dr. Rohé, of Baltimore, said the quarantine of every port in the country was of the greatest importance, and that there should be more system.

Dr. C. N. Hewitt, of Minnesota, said it was impossible to get control of the port of New York, and that what was necessary was to operate through the restriction of commerce on the railroads.

Dr. Hosmer F. Johnson, member of the National Board of Health, said that sanitarians should demand quarantine protection, and not leave it to politicians as to how it should be done. The operation of the quarantine laws would be modified by local interests beyond doubt. He favored the organization of some form of a national health board and a national system of quarantine.

Dr. WILLIAM T. COUNCILMAN, of Baltimore, read a paper on "THE MALARIAL GERM OF LAVERAN." He illustrated his paper by figures on a large map which he had carefully prepared, showing the different stages of the germ during the existence of fever.

At the evening session Dr. JOSEPH HOLT, President of the Louisiana State Board of Health, delivered an address on

"QUARANTINE DEFENCES OF THE MISSISSIPPI VALLEY," considering the subject in general, supplementary to the details of the system practised under his direction comprehended in his contribution to the report of the Committee on Disinfectants, as before submitted and read in abstract by Dr. Rohé.

At the conclusion of Dr. Holt's address, Dr. G. B. Thornton, President of the Memphis Board of Health, said that he could not let the occasion pass without saying that, from his personal observation, he believed that the Louisiana State Board of Health had perfected the best system of quarantine ever enforced in this country, and that that board was entitled to the fullest honor and confidence—an impression generally concurred in by all who have taken the pains to make themselves familiar with it.

At the opening of the session on the third day, the following telegram was read :

ROCHESTER, N. Y., November 8.

*To Dr. Irving A. Watson, Secretary American Public Health Association :*

If Association approves, I will offer one prize of \$500 and one of \$200 for the best essays on the following subject : "Practical Sanitary and Economic Cooking," adapted for persons of small means. If letter mailed to-day does not reach you in time, use telegram.

H. LOMB.

The telegram was received with applause, and on motion was referred to the Executive Committee for action.

The Executive Committee recommended the adoption of the resolution offered by Dr. Rohé, of Baltimore, at the previous session, as follows :

"*Resolved*, That a committee of five, of which the President of the Association shall be chairman, be appointed to study

experimentally the methods and effects of protective inoculations against infectious diseases."

Also the resolution offered by Dr. Oldright, of Canada :

"*Resolved*, That this Association would press upon the attention of railroad, national, State, provincial, and local health authorities the absolute necessity of abolishing the present system of scattering excreta along the railroad tracks, and of substituting therefor some method whereby the excreta can be completely and frequently moved from the trains and tracks, and safely and properly disposed of on sanitary principles."

A resolution offered the day before by Dr. Hunt, of New Jersey, to the effect that :

The Association urge upon Congress the passage of the Miller-Carey bill in regard to diseased animals was amended so as to ask for more comprehensive legislation, and was then adopted.

A resolution offered by Dr. H. B. Baker, of Michigan, looking to the enumeration of food animals in the census of 1890 was adopted.

Dr. A. N. Bell submitted the following proposed amendment to the Constitution : " To strike out of Article 9, referring to members of the Executive Committee, the words, ' and ex-Presidents of the Association ; ' and add to Article 10, entitled, ' Advisory Council, ' after the words, ' as a nominating committee of officers for the ensuing year, ' none of whom shall be members of its own body, thus providing that no member of the Advisory Council can be nominated for office." The amendment, under the rule, was laid over for one year. The following resolutions, by Dr. J. McCormack, of Kentucky, were read and referred :

"*Whereas*, This Association has heard with surprise and alarm that after four years of warning Asiatic cholera found the authorities of the port of New York totally unprepared to deal with it ; and,

"*Whereas*, The administration of the quarantine regulations at all ports, and especially at the port of New York, at this time is of the highest importance ; be it

"*Resolved*, That this Association urges upon the authorities of the State and port of New York such a revision and mod-

ernizing of their methods as will insure protection from exotic plagues.”

Dr. A. N. Bell offered the following :

“*Resolved*, That a committee of three be appointed to consider and report upon such sanitary and medical services on board emigrant passenger vessels as may be subject to Congress.”

This closed the preliminary business, and the regular programme was taken up, beginning with a paper on

“THE DISPOSAL OF GARBAGE,” by Dr. L. LABERGE, Medical Health Officer of Montreal, Canada. He briefly described the difficulty Montreal had encountered in solving this health problem. There, as elsewhere, the principal method of disposing of waste matter was by its removal beyond the city limit, where gulleys, ravines, marshes, quarry pits, etc., could be had to receive it. This system of disposal was a source of great inconvenience, and an actual nuisance, and for several years the city Board of Health was engaged in an attentive study of the question in dealing with the difficulty. Incineration had always been considered the most complete and certain manner of destroying refuse, and in 1885 the board resolved to make an attempt in this direction. A description of the Mann incinerator, which was accepted at a bonus of \$8000 per annum to the inventor, was then given. During the late epidemic another source of danger and alarm arose. It therefore became necessary to institute a special service for the removal and destruction of matter containing the germs of contagious diseases. These were small-pox, diphtheria, scarlet and typhoid-fevers, etc. Destruction by fire of the entire collection of offal removed from the city was decided upon. Again Mr. Mann submitted a tender which the board accepted and the City Council ratified, and in the early part of last year entered into a contract with him, for the period of five years, at the price of \$43,000 per annum. The scavenging work in Montreal is now performed in the following manner: The city is divided lengthwise into three districts, each of which is visited by the scavengers twice a week, between the hours of 7 o'clock P.M. and 8 o'clock A.M. Citizens are required to collect the refuse accumulating on their



premises and put it out in vessels of a capacity not greater than that of an ordinary flour barrel, either in the streets in front of their houses or in the lanes contiguous thereto, when they are large enough to admit of the scavenging vehicles. This matter is then collected by the scavenger and conveyed to the incinerator, where it is destroyed. A by-law formerly existed requiring the separation of the ashes from the garbage, but on account of legal entanglements it was abandoned. At certain periods of the year—viz., during the months of April and May, the scavenging work in Montreal assumed serious proportions, owing to the extensive accumulation formed during the winter. In 1883 the Board of Health, in order to avoid having the streets and lanes filled in the daytime with all kinds of unsightly receptacles, decided to have the work carried on at night. This necessitated an increase in the expenditure over previous years, the total amounting to \$14,000. In 1884 the cost reached \$17,200; in 1885, \$25,000, and last year the contract was given out for five years, at the rate of \$43,000 per year, which sum, however, included the cremation. The paper closed with a descriptive diagram of the Mann patent garbage destructor.

Dr. Roland H. Smith, of Pittsburg, followed by describing and commenting upon the Rider furnace which was put into operation in his city a week before.

Dr. J. F. Kennedy, of Des Moines, Ia., also described a like furnace which was in experimental use under the Board of Health there. Dr. William Oldright, of Canada, gave a very instructive description of the manner in which garbage was cremated at Glasgow, Scotland. He also commented favorably on the Bee Hive destructor, which had proven of excellent use for such purposes. The discussion throughout was very interesting, and was decidedly favorable to the recommendations contained in the paper for the destruction of garbage by cremation. In the discussion which followed, full and deserved credit was awarded Colonel J. M. Keating, editor of the *Memphis Appeal*, for his elaborate paper on "The Ultimate of Sanitation by Fire," read before the Association at its meeting in St. Louis, 1884, published in full in *THE SANITARIAN*, Vol. XIV.

Dr. WALTER WIMAN, of the United States Marine Hospital

Service, opened the discussion of the first of the three questions presented by the committee from the States' Boards of Health, which was as follows :

“WHAT ARE THE PRIVILEGES AND EXPERIENCES OF STATE OFFICERS AS TO THE INVESTIGATION OF EPIDEMICS AT POINTS IN OTHER STATES AND PROVINCES THREATENING TO THEM?”

“WHAT DISEASES SHOULD BE SUBJECT TO INTERSTATE NOTIFICATION, AND SHOULD THERE BE UNIFORMITY IN METHOD?”

He said that “the recent experiences at the New York quarantine have made prominent three facts—viz.: Its state of non-preparation, the apparent division of responsibility therefor, and the great interest and dependence of the whole country upon the New York quarantine.

“Division of responsibility or authority in the presence of sudden danger is disastrous. Should cholera be communicated from Swinburne Island to the adjacent shores, the health officers who would be concerned in its suppression—viz.: town, county, city, State, and even national authorities—might, by their very number, cause confusion of action, and prevent as prompt a suppression as might be had if there were but one powerful authority to whom all the rest might look for direction at the start.

“A national supervision of quarantine would be more equitable even toward the State of New York itself, for it is hardly fair that this State should alone stand the expense and responsibility of preventing immigrated disease. Why should New York be held responsible for infected baggage that is opened in Chicago? Strictly speaking, she need only care for baggage that may be opened within her own borders.

“Any change, however, in the quarantine administration of New York could only be brought about by the New York State authorities themselves.

“Sanitarians are almost unanimous in the opinion that the National Government should manage maritime quarantines. The recent report of the committee of the College of Physicians, of Philadelphia, after reciting the inadequacy of the quarantines at New York, Baltimore, and Philadelphia, recom-

mends 'putting quarantine in the hands of the National Government.' This is no new idea, for as early as 1799, and subsequently in 1878, 1879, 1882, and 1883, Congress passed laws directing national assistance, and permitting, in some cases, national control of quarantine.

"So strong were the appeals for national supervision that in 1879 a National Board of Health was established, which, however, was allowed to expire by the limiting clause in the act, after four years' existence. It should be remembered, however, that the National Board of Health, which was an unsuccessful experiment, was engaged in other work than quarantine defence. Its members proposed to make it a general health authority, absorbing other regular and old branches of service, and if, by attempting too wide a scope, or for whatever other cause, it failed, the inference is not to be made that national supervision of quarantine is a failure.

"Whether the United States should establish a bureau of public health is a question that cannot be answered at the present time. Whether any work to be done by such a bureau excepting quarantine may not as well be done by the respective States is a question not yet settled. National control of the health interests of the several States is a question in the same ill-defined state of solution as the question whether the Government should own and operate the telegraph and railroad lines of the country.

"But on the one question of maritime quarantine there is no longer a doubt as to the advisability of national control, save in rare instances.

"Absolute national control of all quarantines without consent of the State is subject to constitutional objection, but national aid and control of previously weak and imperfect quarantines is not only a desideratum, but is an accomplished fact.

"The national quarantines are administered by the marine hospital service at points where local means are inadequate, or where several States may be guarded by a single quarantine. Thus quarantines are regularly operated at Cape Charles, the Delaware Breakwater, Sapelo Sound, and Ship Island.

"On account of the present alarm about cholera, there has been intimated a project for establishing a bureau of public health.

“Whatever plan is proposed the executive character of quarantine work should be borne in mind, and its administration should be divorced from all matters which have no direct connection with it.

“If Congress chooses to establish huge laboratories and examine the food and drink for the whole nation, that is one thing; but to establish a national quarantine service, is another thing, and any movement is faulty that looks to a combination of these two distinct classes of labor.

“Still, a quarantine service, dissociated from any other service, may, by long-continued disuse, become rusty, so that when needed suddenly, as is generally the case, it is found unprepared. It is fortunate if it can find some natural association which will permit it to lie dormant when not required, yet spring into immediate efficiency at a moment’s notice. It is such an association of the present national quarantine system with the marine hospital service that has made its administration natural, easy, and effective, and before making a labored effort to establish a great national health centre, a complex bureau of health and sanitation, Congress would do well to inquire into the establishments and facilities which the country already possesses.

“The marine hospital service, which administers national quarantine, seems not completely understood by all.

“It is a bureau of the Treasury Department, established in 1798 and reorganized in 1871, and has for its primary object the health interests of sailors; and as sailors in times of epidemic play so important a part, both in carrying disease and as its victims, it seems but a natural part of the work of this service to undertake quarantine labor.

“The service has physicians in every large and many of the smallest parts of the country—about 150 in all.

“Its regular officers, appointed after examination, about forty in number, are ordered from place to place as circumstances demand. They form a well-disciplined body, accustomed to the transaction of public business and familiar with public health matters, and particularly with maritime laws.

“It should be remembered that this service, being under control of the Secretary of the Treasury, can summon at once as quarantine aids the collectors of customs who have by law



the power of search and detention of vessels, and who may be relied upon for accurate home information. By department usage also the Secretary of the Treasury is immediately furnished with copies of all health despatches received at Washington by the State Department from its foreign consuls and ministers, and thus reliable information from abroad is secured.

“ Moreover, the Secretary has a powerful aid in the revenue cutter service, as a naval force to patrol the coast, and as a maritime police to assist in quarantine. This service is under his direct control, as are also two other factors—viz.: The coast survey and light-house establishments.

“ The machinery, then, for national quarantines seems to be already provided and in such constant motion as to prevent its getting rusty or being taken unawares by any sudden invasion.

“ But little legislation is required. Additional appropriations for the maintenance and equipment of the Government quarantine stations are necessary, and an enactment providing a penalty for violation of the United States quarantine laws. If all maritime quarantines were under control of this bureau, the responsibility for their effectiveness would be fixed and definite, and their administration would be marked by unity of purpose, which would insure justice to all sections.”

The paper elicited quite a lengthy discussion from a number of the members, which is given in brief :

Dr. Holt said : Theoretically, putting the whole question in the hands of the National Government seems a plausible solution, but when it comes to putting it into practice he begged the Association to go slow before recommending such a course. He advocated national aid, but not national control. He said that centring a sovereign power in the marine hospital service or a National Board of Health would be very dangerous.

Dr. Bell was opposed to merging the marine hospital service and quarantine service. He looked upon the duties of the marine hospital service under existing laws, confined to the care of sick seamen, as being wholly distinct from the sanitary care of ships and the prevention of disease. And with regard to the remark by the President, to which he had before alluded, “ that the people protected should pay the cost of such protection,” and the national control contemplated in

the paper to which we have just listened, such a service would be a premium on filthy ships ; health officers would lose the most efficient means of discipline—that of holding ship-owners and masters responsible for the sanitary condition of the ship. Cleanly vessels, it is well known, are rarely subject to infectious diseases ; hence the expense incurred in the care of diseases due to unsanitary conditions and in the purification of vessels should certainly, in his judgment, be borne by the owners and commanders of vessels who tolerate such conditions, no matter what the administrative authority—national, State, or port.

Dr. Falligant, of Savannah, said the marine hospital service was not properly equipped, and did very little good. He thought the National Government should make the service better.

Dr. Lachapelle, of the Quebec Provincial Board of Health, said that in the absence of national control laxity in the enforcement of quarantine laws might be expected.

Dr. Salomon, of New Orleans, said he believed that a national system of quarantine would be an interference with the police powers of States, and unconstitutional.

Dr. Horlbeck, of Charleston, did not think the marine hospital service was properly equipped. The general Government should aid in quarantining by establishing stations.

Professor William H. Brewer, Yale University, New Haven, Conn., favored national aid, but not national control.

Dr. Rutherford, Health Officer of the State of Texas, was opposed to national control, but was not averse to congressional appropriation to support weak places.

Dr. McCormack, of Kentucky, moved that the question be referred back to representatives of State Boards of Health, which was carried.

The second and third topics, which are as follows, "What are the Privileges and Experiences of State Officers as to the Investigation of Epidemics in Other States or Provinces Threatening Them?" and "What Diseases Should be Subject to Interstate Notification, and Should These be Uniform in Method?" were then read, but the discussion on them was cut short by the expiration of the morning hour.

At the evening session the first paper read was on

“RIVER POLLUTION IN CONNECTICUT,” by Professor W. S. WILLISTON, of New Haven, Conn., which in the absence of the author was read by Dr. C. A. Lindsley, Secretary of the State Board of Health of Connecticut. It treated of the contamination of the rivers of the State by sewage, and stated that were it not for the fact that there were abundant inland bodies of water which were kept free from obnoxious flowage, the water-supply in that State would have long since been exhausted for cleanly consumption. The question was, how much sewage an open stream of water could carry and not make it unwholesome for people to live upon its banks. From a careful examination and test of the fresh-water streams in the State, they had about reached that limit. This was followed by a paper on the same subject by RUDOLPH HERRING, C. E., lately the chief engineer of the sewage commission of Chicago. He stated that he had not come to the convention with any intention of reading a paper, but that at the request of many of the members he had prepared since his arrival a few notes on the question of selecting a water-supply. Engineers had assumed that water which had the minimum amount of organic matter and oxygen was palatable. He mentioned quite a number of rivers in the north and northwest which would have to be abandoned for water-supplies on account of their pollution from sewage flowage.

With regard to a paper on the same subject by CHARLES SMART, M.D., Major and Surgeon United States Army, Dr. Hewitt, of Minnesota, expressed great regret that it could not be presented. He had had the pleasure of reading it, and knew that it would have been highly appreciated by the Association. It was to have been read, in the absence of the author, by Professor Daniel, of Madison, Wis., but Professor Daniel did not have it, and it could not be found. As Secretary of the Minnesota State Board of Health, he had much to do in the same line of investigation, and he described to some extent the investigations which were going on to prevent the pollution of the country's water-supply.

“PRIME REQUISITES AND SUGGESTED IMPROVEMENTS IN THE CONSTRUCTION AND METHOD OF LAYING SEWERS AND DRAINS FOR HOUSE DRAINAGE,” was the subject of a brief paper by Dr. L. A. FALLIGANT, of Savannah, Ga. .

The several papers were briefly discussed by Drs. Brodie, Falligant, Probst, Duffield, Rauch and Walcott, and Professor Brewer, all of whom spoke of the alarming extent to which the water-supplies of the country were being polluted.

On the fourth and last day's session the first business in order was the report of the Advisory Council and the election of the following

OFFICERS FOR THE ENSUING YEAR, AND THE NEXT PLACE  
OF MEETING.

President, Dr. Charles N. Hewitt, Minnesota ; First Vice-President, Dr. G. B. Thornton, Memphis, Tenn.; Second Vice-President, Dr. Joseph Holt, New Orleans, La.; Treasurer, Dr. J. Berrien Lindsley, Nashville, Tenn., re-elected. Dr. Irving Watson, New Hampshire, Secretary, was elected for three years, and has two more years to serve. The members of the Executive Committee are : H. B. Baker, Michigan ; S. H. Durgin, Massachusetts ; J. N. McCormack, Kentucky. The place of meeting will be Milwaukee, Wis.

The following resolution was adopted :

*"Whereas*, In the judgment of this Association, some form of national health administration is essential to the protection of the nation, and to a proper use of the various facts and statistics that can be collected from the States and Territories ; therefore,

*"Resolved*, That the Advisory Council endorses the recommendation of the President of the Association relating to the creation of the office of health commissioner by the general Government ; and further, that we earnestly recommend that the Association use all warrantable means toward bringing about the necessary legislation to create such an office.

*"Resolved*, That a committee of five be appointed by the President for the purpose of recommending such legislation."

The following resolution, which was introduced at Wednesday's session, was adopted, to which was subjoined the memorandum of the committee who reported it :

*"Resolved*, That this Association urges its membership to recommend their representatives in Congress to further by all means in their power additional appropriations for the main-



tenance and equipment of the United States quarantine stations at Delaware Breakwater, Sapelo, Cape Charles, and the Gulf of Mexico, and that legislation providing a penalty for the violation of the United States quarantine laws is, in our opinion, an urgent necessity.

“The committee to whom was referred the resolution by Dr. William C. Otterson, of Brooklyn, recommending congressional appropriation for the proper maintenance and equipment of the national quarantine stations at Delaware Breakwater, Sapelo Sound, Cape Charles, and the Gulf, as well as legislation providing a penalty for violation of the United States quarantine law, have respectfully to offer the following memorandum and report :

“The resolution calls for the establishment of nothing new. The four quarantine stations mentioned are already established, and, even if not provided with the better equipment requested, will continue to be administered in their present condition.

“They are the only four stations which are regularly operated by the National Government and have been put under the control of the National Government by the specific request of United States Senators, representatives, health officers, and others interested in the sanitary welfare of the respective districts which they are intended to protect.

“The question whether other localities should not likewise be favored with a national quarantine, and the question whether some other bureau of future creation might not wish to possess their management are neither of them germane.

“The fact that even in their imperfect condition these stations have been of great value in the past, and notably as at Sapelo this past summer, and the painful fact that cholera stands to-day picking at the barriers on our shores, are reasons sufficient for the immediate endowment of these national maritime quarantines with all that is required for successful defence against epidemic diseases.

“The committee, therefore, respectfully report in favor of the resolution.”

The following paper, which was to have been read and discussed, was only read by title :

“THE SANITARY WORK OF THE DEPARTMENT OF HEALTH,

BROOKLYN, N. Y.," by A. OTTERSON, M.D., Commissioner of Health, Brooklyn, N. Y.

ADVISORY COUNCIL.

Dr. John C. Dozier for Dr. Jerome Cochran, of Alabama ; Dr. Falligant for Dr. W. H. Elliott, of Georgia ; Dr. Rauch for Dr. Oscar C. De Wolf, of Illinois ; Dr. Taylor for Dr. I. D. Gatch, of Indiana ; Dr. Councilman for Dr. W. C. Van Bibber, of Maryland ; Dr. Holt for Dr. S. H. Durgin, of Massachusetts ; Dr. Duffield for Dr. J. H. Kellogg, of Michigan ; Dr. Killington for Dr. D. W. Hand, of Minnesota ; Dr. Meade for Dr. Wirt Johnson, of Mississippi ; Dr. Fulton for Dr. E. A. Nelson, of Missouri ; Dr. Hunt for Dr. William K. Newton, of New Jersey ; Dr. Otterson for Dr. A. Mercer, of New York ; Dr. Probst for Dr. R. Harvey Read, of Ohio ; Dr. Horlbeck for Dr. H. D. Fraser, of South Carolina ; Dr. R. Mitchell for Dr. J. D. Plunket, of Tennessee ; Dr. Rutherford for Dr. R. M. Swearingin, of Texas ; Dr. Reeve for Dr. C. T. Richardson, of West Virginia ; Professor W. H. Daniels for Dr. J. T. Reeve, of Wisconsin ; Dr. Wyman for Dr. C. W. Covernton, of the Dominion of Canada ; Dr. Laberge for Dr. E. N. Boyce, of the Province of Quebec.

Dr. Rohé, of Baltimore, then submitted the following complimentary resolutions, which were adopted amid applause :

"*Resolved*, That the thanks of the American Public Health Association be hereby extended to Dr. George B. Thornton, chairman of the local committee of arrangements, and his committee for the excellent arrangements made for the present meeting ; to the members of the Government of the Taxing District of Shelby County for the many courtesies extended ; to the editors and reporters of the *Memphis Appeal*, *Memphis Avalanche*, *Memphis Evening Scimitar*, *Memphis Evening Ledger*, and the *Sunday Times* for their full and excellent reports of the proceedings of the meeting and for their editorial comments ; to the Hon. R. L. Taylor, Governor of Tennessee, and Judge J. W. Clapp for their eloquent addresses of welcome ; to the Western Union Telegraph Company, the various railway and transportation companies, the Cotton and Merchants' exchanges, the governors of the Tennessee, Chickasaw, and Memphis jockey clubs ; the proprietors of the Gayoso, Peabody, and other hotels for courtesies extended ; to Hon. E. S. Hammond, United States District Judge, for the use of his court-room in the custom-house as a

meeting-room ; to Captain T. F. Tobin, United States Surveyor of Customs and Custodian of Custom-House, for many courtesies extended ; to Mr. Hugh Anderson, for the use of one of his rooms adjoining the court-room for the use of the Treasurer ; to Major John D. Adams and Captain James Lee, Jr., for proffered courtesies, and to all the ladies and gentlemen of Memphis who have contributed so much to our pleasure and entertainment during the meeting." \*

The Association then adjourned.

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## EDITOR'S TABLE.

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### THE NEW YORK QUARANTINE ESTABLISHMENT—ITS PRESENT CONDITION AND NEEDS.

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NEARLY sixteen years ago (*SANITARIAN*, Vol. I.) this writer described the New York quarantine establishment as it at that time existed, illustrating its situation and condition with a chart of the harbor and drawings of the structures.

As viewed at that time (contemplating the completion of the structures then far advanced) warehouses "with appropriate appurtenances for unloading and storing cargoes of such capacity only as will secure the best natural ventilation consistent with security for merchandise, with suitable appliances for special disinfection by forced ventilation, refrigeration, high steam, dry heat, and chemical disinfection" (Sec. 4, Act Establishing Quarantine, 1863), were the important provisions of the law wholly lacking to make it the most complete quarantine establishment in the world. Unfortunately, the new appointees at that time (1873) had everything to learn with regard to the necessities, and they fell into the waning interest of public sentiment and legislative indifference with regard to the future, because no epidemic was then threatening. It would go without saying, if addressed to those only who are familiar with quarantinable diseases, that such diseases are always alive somewhere ; that the conditions under which they exist are more or less cultivated in all large communities, and that they are ever liable to be transported from one community to another by commercial intercourse, unless special means are used to prevent them ; and that community is the

safest, the healthiest, the strongest, and the richest which maintains the best safeguards against the introduction of preventable diseases.

For a proper appreciation of the present disgraceful condition of the establishment, the reader's attention is invited to our remarks on other pages of this number (pp. 433-442).

The *immediate* necessities are apparent. To clear away the débris from, repair and finish the construction of Hoffman Island, and supply disinfecting apparatus.

The repairs and additions now urgently required to prevent rapidly increasing damage and expense are of the beton wall, riprap, and wharf. The whole surface should then be raised with sand filling, thoroughly compacted to a level with the beton wall, and covered with asphalt or other cement paving material, which will admit of hose washing.

With regard to warehouses and the paraphernalia connected therewith, contemplated by the quarantine law at the time it was drawn, such progress has been made in the processes of disinfection since that time, that a warehouse, in the sense commonly understood, may well be dispensed with. The processes of disinfection are now so well understood, expeditious and reliable, such additional structures only are required as are necessary for their application ; and for these there is an abundance of space on Hoffman Island.

Two comparatively inexpensive buildings are required ; one as a disinfecting house for personal effects, thirty by fifty feet, on the northeast angle, conveniently situated with reference to the engine, deemed to be amply sufficient, in the sanitary building on that end of the island. For this proposed building two disinfecting chambers are required, to be constructed of boiler iron, each one forty feet long, twelve feet wide, and eight feet high, divided into two compartments, and with doors at the ends the full size of the opening. One of these chambers should be made strong enough to stand twenty pounds steam pressure. The other one should be constructed with special reference to the use of dry heat radiated from steam-pipes on the inside.

The other building should be a shed, with wide projection, to occupy all of the available space on the south side of the slip, and supplied with steam disinfecting apparatus for the



disinfection of merchandise, and particularly adapted to bale goods—rags, cotton, wool, etc. And in connection therewith every practicable facility should be provided for the transfer of merchandise from and to lighters or other vessels in the slip. Moreover, the water should be deepened in the slip by dredging, and this could be economically accomplished by making this the place for scooping up sand to raise the surface of the island to the necessary level with the beton wall.

The boarding or other steamboat belonging to the establishment should be provided with a large and powerful engine, capable of sustaining one hundred pounds or more boiler pressure, and asbestos-wrapped flexible hose with special reference to the greatest possible despatch in disinfecting vessels and certain kinds of cargoes on board with steam.

Lavatories and latrines should be constructed apart from but under covered pass-ways, near each end of the sanitary buildings, on a scale equal to the necessities of one thousand persons. Four groups of latrines, with twenty seats and five bath-tubs each; and the seats should all spring up. The waste should be delivered entirely clear of the riprap.

The steam disinfecting apparatus should be restored and elaborated at the Swinburne Hospital. The tub removed therefrom, however, is so decayed as to be beyond repair. The steam-box, used in the emergency, and now in place on Hoffman Island, is well suited to the necessities of the hospital, and it can probably be purchased at a less price than would be the cost of making one. At this island (Swinburne) also, the riprap needs additional strengthening, and the steam-heating apparatus overhauling.

The hospital ship and lower bay boarding station, Illinois, is as stated in the pages referred to probably beyond repair. This portion of the establishment has always been a makeshift—an old hulk with attempted adaptations to hospital purposes at greater expense than it would be to build one. One should be constructed of such draft, breadth of beam, and other qualities, as would make her thoroughly serviceable for all of the requirements. This deficiency is especially onerous to merchants in consequence of the delay in boarding, and, moreover, the lower bay boarding station is essential to the safe protection of healthy ships in the close quarters of the

upper boarding station, by confining the infected to the lower bay. The rules should be strict in this regard, and the means for executing them should not be wanting.

The Health Officer's premises on Staten Island, like the rest, not having had any repairs of consequence for fifteen years, are also in very bad condition. The dock, especially, is decayed, and without early and extensive repairs will be unsafe as a landing-place.

With these repairs and additions under competent supervision, according to law, it is safe to say the expenses of quarantine and obstructions to commerce may be reduced to a minimum, and the protection of the public health from quarantinable diseases rendered certain.

#### MORTALITY AND MORBILITY STATISTICS AT THE MOST RECENT DATES.

ALABAMA.—*Mobile* reports for the month of September 93 deaths in a population estimated at 31,295, of which 40 were under five years of age, representing an annual death-rate of 34.6 per 1000. From zymotic diseases there were 32 deaths, and from consumption, 5.

CALIFORNIA.—Mortality returns from 62 towns, with an estimated aggregate population of 636,150, for the month of September, 795; average annual death-rate, 14.88. Deaths from zymotic diseases, including 18 from alcoholism, 123; 35 from diphtheria and croup, of which 17 were in San Francisco; 25 from typhoid-fever, and of these 9 were in San Francisco. From consumption, 97, 43 in San Francisco, where the total number of deaths from all causes was 427; population estimated at 300,000.

CONNECTICUT.—Abstract of reports of mortality and its causes throughout the State, and specially in 28 towns of more than 5000 inhabitants each, aggregating 454,400 during the month of September, total deaths, 678: representing an average annual death-rate of 17.9 per 1000. Deaths under five years, 273. No fatal epidemic was reported from any part of the State. The deaths from zymotic diseases were as follows: Cerebro-spinal fever, 3; diarrhœal diseases, 84; diphtheria

and croup, 32 ; erysipelas, 2 ; malarial fevers, 14 ; scarlet-fever, 7 ; typhoid-fever, 22 ; whooping-cough, 3 ; consumption, 92—13.5 per cent of the total mortality.

The *lowest* death-rates were in Naugatuck, 10 ; Norwich, 11.15 ; Killingly, 12 ; Meriden, 12.5 ; Winchester, 12.7. The *highest* death-rates were in Enfield, 29.1 ; Putnam, 26.4 ; Stanford, 25.7 ; Groton, 25.6 ; Vernon, 24.

The general health of the State was better than in August. The total mortality was 1006 as against 1278 in August, representing an annual death-rate of only 17.9 per 1000 of population as against 22.3 in the month before.

DELAWARE.—*Wilmington* reports for the month of September 62 deaths in a population estimated at 57,000, of which 29 were under five years of age, representing an annual death-rate of 13.05 per 1000. From zymotic diseases there were 12 deaths, and from consumption, 10.

ILLINOIS.—*Chicago* reports for the month of September 1120 deaths in a population estimated at 760,000, of which 595 were under five years of age, representing an annual death-rate of 17.69 per 1000. From zymotic diseases there were 374 deaths, and from consumption, 91.

*Rock Island* reports for four weeks ending September 24th, 12 deaths in a population estimated at 13,655, of which 5 were under five years of age. Death-rate, 9.2 per 1000. From zymotic diseases there were 4 deaths.

IOWA *Bulletin* reports for the month of September reported in October number.

LOUISIANA.—*New Orleans* reports for September 304 deaths in 176,500 white population, and 164 deaths in 66,250 colored population—making the respective death-rates 20.6 and 29.7 per 1000, and 23.13 for the whole population of 242,750.

The deaths from zymotic diseases numbered 101, and from consumption, 68. There were 174 deaths under five years.

MAINE.—*Sanitary Inspector* for October states that : " At the quarterly meeting of the State Board of Health, September 26th, the secretary reported that the municipal officers in

all but 13 towns had made the appointment of a local board of health. There had therefore been reported to this office 432 local boards of health. Of these 19 had not yet reported their organization to the State Board as the law requires."

MARYLAND.—*Baltimore* reports for four weeks ending September 24th, 626 deaths in a population estimated at 437,155, of which 279 were under five years of age. Death-rate, 18.56 per 1000. From zymotic diseases there were 149 deaths, and from consumption, 78.

MASSACHUSETTS.—*Boston* reports for the month of September 817 deaths in a population estimated at 400,000, of which 337 were under five years of age, representing an annual death-rate of 24.5 per 1000. From zymotic diseases there were 202 deaths, and from consumption, 123.

MICHIGAN.—For the month of September, 1887, compared with the preceding month, the reports indicate that bronchitis, typho-malarial-fever, influenza, and typhoid-fever increased, and that cholera-infantum, cholera-morbus, dysentery, diarrhoea, whooping-cough, and remittent-fever decreased in prevalence.

Compared with the average for the month of September in the nine years, 1879-1887, intermittent-fever, remittent-fever, consumption of lungs, cholera-infantum, diphtheria, and whooping-cough were less prevalent in September, 1887.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of September, 1887, at fifty-one places, scarlet-fever at twenty-one places, typhoid-fever at forty-six places, measles at five places, and small-pox at one place.

Reports from all sources show diphtheria reported at two places more, scarlet-fever at seven places less, typhoid-fever at three places less, measles at five places less, and small-pox at one place more in the month of September, 1887, than in the preceding month.

Compared with the preceding month, the temperature in the month of September, 1887, was lower, the absolute humidity was less, the relative humidity was more, the day ozone was much less, the night ozone was about the same.



For the month of September, 1887, compared with the average of corresponding months for the nine years, 1879-1887, the temperature was lower, the absolute humidity was slightly less, the relative humidity was more, and the day and the night ozone were less.

*How Scarlet-fever Comes to Michigan* is strikingly illustrated by the following communication on information received from Dr. Sipton, Health Officer of Sutton's Bay township: "October 2d, 1887, a family arrived in Sutton's Bay, Leelenaw County, direct from Norway. The family came over in the Steamship Ohio, of the Inman Line, reaching New York, September 30th. Scarlet-fever was on board the steamer during the passage, one child dying before the landing, and 'several more were sick in the same way.' One child of this family was taken sick with scarlet-fever the day after reaching New York. The family, however, proceeded over the New York Central and the Lake Shore and Michigan Southern to Michigan; then over the Detroit, Grand Haven and Milwaukee, and the Grand Rapids and Indiana to Traverse City; then to Sutton's Bay. Another child of the family has since come down with the disease. The family had a certificate, signed by the surgeon of the steamer, that they had been protected by vaccination against small-pox; so they passed without detention the quarantine authorities at the port of New York, after they had been exposed to a contagious disease which causes more deaths by far in this country than small-pox causes."

*Quarantine Does not Deal with the most Dangerous Diseases.*—Relative to the persons who brought scarlet-fever to Sutton's Bay, Mich., and who came on the Steamship Ohio, reaching New York, September 30th, 1887, Dr. William M. Smith, Health Officer of the port of New York, says:

"Developed cases of diphtheria and scarlatina arriving on vessels at this port are removed to Ward's Island. It is impossible under the law for the health officer or the authorities at Castle Garden to quarantine persons who have been exposed to the contagion of those diseases, consequently the sick on board vessels during the voyage, doubtless often infect the relatives or those with whom they come in contact, . . . and who carry the latent contagion to interior communities. I would be glad if the law allowed those exposed to the con-

tagion of these diseases to be held for observation as is the case when persons are exposed to the contagion of small-pox."

The instance mentioned above is an illustration of what Dr. Smith says, the child having been exposed during the voyage, and taken sick with scarlet-fever the day after arrival at New York ; so the infected child went on its way to spread scarlet-fever. In Michigan, at least, ten times as many deaths occur from either scarlet-fever or diphtheria as from small-pox.

Is it not time that the whole subject of quarantine was investigated by the States and by the United States Government, with a view to protecting the people of this country from the introduction of the really dangerous diseases?

*How Typhoid-fever is Spread, and How it may be Prevented*, is also pretty well shown by the following account of Lapeer City, reported to the secretary by Dr. H. McCall: "About September 1st, 1887, Myron Gardner, railroad employé, arrived at his home from the South sick with fever. His case was supposed to be malarial. No care was exercised with stools in the way of disinfection, but they were thrown into the privy vault in the rear of the house, and in close proximity to the well. Waste water was thrown on the surface of the ground, which was very dry at the time. About September 7th or 8th a copious rain fell and soaked the sandy soil ; and on the 14th William Gardner and wife, father and mother of Myron, and E. D. Gardner, a brother (who was a student in my office), and who boarded at home, were attacked with fever. On this day I got home from Washington, and found four of them down with a severe type of typhoid-fever, and in two weeks Myron's wife and child were attacked. Also a child across the street at Terry's, who had used water from the Gardner well. About the same time three cases in the Clifford house, south of Gardner's, who also used water from the Gardner well. None of the people from either of these houses were in the Gardner house. In the Walker house, still farther south, one case has occurred, and I was at a loss to account for this case till a few days ago, when the young man said that at the mill where he was working they had used the Gardner water for a few days, owing to disarrangement of the pump at the mill. Two others of the mill hands—Anderson and Lester—who used the same water were attacked about

the same time. Lester is now convalescent. Anderson is dead, as also the child at Terry's. When I took charge of the cases I ordered the discontinuance of water from the Gardner well and the disinfection of the stools, and no new cases are now reported. People who assisted to take care of the Gardner and other families, and who use water from other sources, have not been attacked. Clearly Myron Gardner brought the fever to his home, the well became infected after the first rain from slops and privy, and the other cases got their seed from the water."

The foregoing instructive account of the way typhoid-fever was spread in one instance is reproduced in the hope that it may lead others to trace the spread of this disease, and, what is of greater importance, act intelligently for the prevention and restriction of the disease, as Dr. McCall did in this instance.

Very respectfully,

HENRY B. BAKER, *Secretary*.

*Detroit* reports for the month of September 299 deaths in a population estimated at 200,000, of which 63 were under five years of age, representing an annual death-rate of 18.18 per 1000. From zymotic diseases there were 118 deaths, and from consumption, 25.

MINNESOTA *Bulletin* reports *infectious diseases* during the month of September :

Diphtheria, 32 cases, 9 deaths ; scarlatina, 5 cases, no deaths.

*Diseases among animals* : Cases of glanders remaining isolated or not accounted for, 35 ; reported during the month, 17 ; killed, 14 ; released, 1. Remaining September 1st, isolated or not accounted for, 37.

*St. Paul* reports for the month of September 142 deaths in a population estimated at 150,000, of which 69 were under five years of age, representing an annual death-rate of 11.33 per 1000. From zymotic diseases there were 62 deaths, and from consumption, 15.

MISSOURI.—*St. Louis* reports for the month of September 804 deaths in a population estimated at 420,000, of which 369 were under five years of age, representing an annual death-

rate of 23.0 per 1000. From zymotic diseases there were 312 deaths, and from consumption, 49.

NEW JERSEY.—*Hudson County* reports for the month of September 501 deaths in a population estimated at 258,000, of which 224 were under five years of age, representing an annual death-rate of 23.0 per 1000. From zymotic diseases there were 120 deaths, and from consumption, 58.

*Newark* reports for the month of September 305 deaths in a population estimated at 165,300, of which 144 were under five years of age, representing an annual death-rate of 22.18 per 1000. From zymotic diseases there were 61 deaths, and from consumption, 35.

NEW YORK.—The State Board *Bulletin* reports the total mortality of 124 cities and towns, comprising a population of about 3,500,000 inhabitants, during the month of September, 8267; the percentage of deaths under five years being 39.0. From zymotic diseases there were 2159 deaths, or 261.15 per 1000 total mortality. Of these 122.05 per 1000 total mortality were from diarrhœal diseases; 29.15 from typhoid-fever; 67.62 from diphtheria. Deaths from small-pox occurred in New York, Edgewater, and the Kings County Hospital; the disease has been reported from no new locality. There is an increase in the number of deaths from malarial diseases. From consumption the death ratio per 1000 is 118.55, and 195.80 per 1000 above the age of five years. The combined death ratio from consumption, zymotic, and puerperal diseases is 385.14. The death-rate from acute respiratory diseases is 83.70.

*New York City*, 1,481,920: Deaths for the month, 3045; under five years, 1354; of zymotic diseases per 1000 from all causes, 262; diarrhœal diseases, 417; croup and diphtheria, 190; typhoid-fever, 53; measles, 7; malarial diseases, 43; whooping-cough, 22; small-pox, 5; scarlet-fever, 30; consumption, 404; acute respiratory diseases, 337. Death-rate, 25.35. Percentage of deaths under five years to total deaths, 45.

*Brooklyn*, 757,755: Deaths, 1366; under five years, 691; of zymotic diseases per 1000 from all causes, 250; from diarrhœal diseases, 155; croup and diphtheria, 130; typhoid-fever, 21;



malarial diseases, 36 ; whooping-cough, 5 ; scarlet-fever, 16 ; consumption, 172 ; acute respiratory diseases, 137. Death-rate, 23.54. Percentage of deaths under five years to total deaths, 47.1.

*Buffalo*, 202,818 : Deaths for four weeks ending October 1st, 484 ; under five years of age, 259 ; diarrhœal diseases, 79 ; zymotic diseases per 1000 from all causes, 336.72 ; typhoid-fever, 16 ; cerebro-spinal-fever, 6 ; scarlet-fever, 6 ; measles, 4 ; whooping-cough, 2 ; malarial diseases, 5 ; croup and diphtheria, 34 ; consumption, 31 ; acute respiratory diseases, 32. Death-rate, 24.82. Percentage of deaths under five years to total deaths, 52. 7.

*Rochester*, 110,000, month of September : Deaths, 175 ; under five years, 59 ; of zymotic diseases per 1000 from all causes, 280 ; from diarrhœal diseases, 26 ; croup and diphtheria, 10 ; typhoid-fever, 9 ; consumption, 24 ; acute respiratory diseases, 6. Death-rate, 18. Percentage of deaths under five years to total deaths, 40.03.

*Albany*, 96,000 : Deaths, 148 ; under five years, 41 ; percentage of deaths under five to total, 27.7 ; cerebro-spinal-fever, 1 ; typhoid-fever, 5 ; scarlet-fever, 3 ; croup and diphtheria, 12 ; diarrhœal diseases, 10 ; from zymotic diseases per 1000 from all causes, 209 ; consumption, 24 ; acute respiratory diseases, 12. Death-rate, 18.75.

*Syracuse*, 78,000 : Deaths, 89 ; under five years, 25 ; percentage of deaths under five years to total, 27.8 ; typhoid-fever, 3 ; malarial diseases, 4 ; croup and diphtheria, 1 ; diarrhœal diseases, 6 ; zymotic diseases per 1000 deaths from all causes, 167 ; consumption, 9 ; acute respiratory diseases, 12. Death-rate, 13.7.

*Lowest death-rates* : The five cities of 10,000 inhabitants and upward in the State of New York having the lowest death-rates during the month of September, were Hornellsville (10,000), 7.20 ; Oswego (24,000), 9.50 ; Ithaca (10,000), 9.60 ; Lockport (15,000), 10.40 ; Gloversville (10,000), 10.80.

*Highest death-rates* : The five cities of 10,000 inhabitants and upward in the State of New York having the highest death-rates during the month of September, were Saratoga Springs (10,000), 40.80 ; Schenectady (15,000), 37.60 ; Long Island City (21,000), 34.85 ; Newtown (10,000), 34.80 ; Edgewater (10,000), 30.

OHIO weekly health *Bulletin* for five weeks ending September 30th, reports cases of measles, 18 ; diphtheria, 118 ; scarlet-fever, 68 ; whooping-cough, 79 ; typhoid-fever, 73 ; typho-malarial fever, 153 ; cholera-infantum, 116 ; and other diarrhœal diseases, 914.

*Cincinnati* reports for the month of September 388 deaths in a population estimated at 325,000, of which 143 were under five years of age, representing an annual death-rate of 14.32 per 1000. From zymotic diseases there were 92 deaths, of which 20 were caused by diphtheria and croup ; 23 by typhoid-fever. Deaths from consumption, 51.

*Cleveland*, 210,000 : Deaths, 323 ; under five years, 193 ; from zymotic diseases, 147, of which 42 were caused by diphtheria and croup ; 15 by typhoid-fever. Consumption, 14. Death-rate, 18.45.

*Toledo*, 76,000 : Deaths, 88 ; under five years, 35 ; from zymotic diseases, 30, of which 5 were caused by typhoid-fever ; diphtheria and croup, 7 ; consumption, 8. Death-rate, 13.89.

*The Ohio State Sanitary Association*.—Fifth annual meeting is announced to take place at Toledo, February 9th–10th, an unusually interesting meeting is anticipated. All communications should be addressed to the secretary, R. Harvey Reed, M.D., Mansfield, O.

PENNSYLVANIA.—*Report of the Secretary* (Benj. Lee, M.D.).

*To Hon. David Engleman, M.D., President of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.*

SIR : In presenting his Third Annual Report in compliance with the by-laws of the board and with the provisions of the act which creates it, the Secretary hesitates between first offering expressions of congratulation on the excellent state of the public health during the past year, or of condolence on the great loss which the board has sustained in the death of its first President. He may perhaps be pardoned if he yields to the impulse of his heart rather than to the exact requirements of official routine, and asks you to unite with him for a moment in recalling the eminent virtues of our deceased friend

and coadjutor from a sanitarian's standpoint. The fact that the Secretary and himself had been fellow-students in the University of Vienna, established at the outset a bond of sympathy between them which further intimacy only served to strengthen, and afforded the former an unusual opportunity for judging of his true character.

His imperfect knowledge of English and his strong accent, coupled with a certain abruptness of manner, made it difficult for casual acquaintances to appreciate his many excellencies, and such persons rarely penetrated beyond the somewhat prickly husk which concealed the kernel of his generous nature. The fact that he was exiled from his native land for engaging in revolutionary projects sufficiently attests his courage, zeal, and faithfulness to his convictions. He was a thoroughly educated man, having a good knowledge of Latin and French, and having gone successfully through the severe curriculum of the German medical schools. His attention, as a student, was called to the then infant science of hygiene, and he attended assiduously the lectures of the earliest professor of that branch in Europe. His fellow-citizens in the land of his adoption were not slow in recognizing his abilities, and he was called to the responsible position of Health Officer of Erie, a post which he filled with singular fidelity and acceptability up to the time of his last illness.

It has been well said of him, that during the epidemic of small-pox in that city, some years since, he was health officer, physician, nurse, and undertaker. While unsparing in his denunciation of those who, knowingly and for gain, jeopardized the health and lives of their fellows, he was extremely forbearing toward the poor, whose infractions of sanitary law were the result of ignorance. His elaborate paper on the Trichina Disease was one of the early contributions to the literature of that subject in this country, and attracted universal attention on the part of physicians and scientists.

The forthcoming Annual Report of this board will contain an article from his pen, giving the history of successive outbreaks of that formidable disease in and near the city of Erie. As a public speaker he was always listened to with extreme attention, notwithstanding his imperfect pronunciation, on account of his forcible way of putting things, and especially of

his keen and ready wit. In the prosecution of official duty, as in the utterings of his opinions, he was absolutely fearless, and cared not whom he offended, while at the same time his frankness, geniality, and sense of humor went far to make men accept his caustic criticism without resentment.

The day of his funeral was a day of general mourning in the beautiful city by the lake, whose port he had so faithfully guarded against the intrusion of foreign pestilence. The places of business were closed, and the citizens turned out as by a common impulse to follow to its last resting-place the honored form of him who had been to them so honest a public servant, so wise a counsellor, so firm a friend.

The State Board of Health of Pennsylvania may well congratulate itself on having had such a true, grave, and learned man as *Edward William Germer* as its first President.

As has been intimated, the year which is drawing to its close has been marked by a singular exemption from widespread epidemics. At no time during the past decade, in which your Secretary has been giving especial attention to the health of the State, has there been a twelvemonth of such remarkable immunity from pestilence. When the fact is borne in mind that the heat of the past summer has been unequalled since the centennial year, the suggestion may be pardoned that the influence of the board for good in a practical way is already making itself felt; that the precautionary circulars which, owing to the wise generosity of the Legislature in the matter of printing, the board has been enabled to scatter by tens of thousands throughout the length and breadth of the State, through health officers, boards of health, and sanitary committees, through burgesses and mayors, through the Board of Public Charities and the Board of Public Instruction, through physicians and ministers of the Gospel, through manufacturers and employers, describing in clear and popular language the characters and favoring circumstances of all the infectious diseases, and the means to be adopted for their prevention, have begun their beneficent work of educating the people in things which pertain to the preservation of health and avoidance of disease. The circulars which have been added during the year to those already prepared and promulgated have been on the following subjects—viz. : Typhoid-



Fever, Scarlet-Fever, Diphtheria, Trichinosis, Contagious and Infectious Diseases Generally, and the Hygienic Care of Infants. In the preparation of these circulars, the Secretary desires to acknowledge the valuable assistance of Professor George G. Graff, of Lewisburg, Medical Inspector to the board for the Northumberland District, but since, in the wisdom of the Chief Executive of the Commonwealth, elevated to a seat upon our board, a choice on which we and the State may well congratulate ourselves. Another change in the *personnel* of the board has been necessitated by the resignation of our civil engineer, Mr. Rudolph Hering. This was not the result of any failure of that gentleman's interest in the work of the board, but was made necessary by his change of residence to a distant portion of our country. The same eminent ability as a sanitary engineer, which led to the conferring upon him of the honor of an appointment on this board, recognized by the authorities of the metropolis of the West, has been the means of his transference to another field of labor, not less honorable and more lucrative. While we regret the departure of one so thoroughly qualified by natural endowment, by education and by a thorough acquaintance with most of the local problems of our State in the matter of water-supply, for the position which he held with us, we can but congratulate him on his well-merited success. His place, however, has been fortunately in great measure made good by the appointment, as his successor, of Mr. Howard Murphy, of Philadelphia, a gentleman who had shared with him much of the labor of the exploration and investigation of the watersheds of the eastern part of the State, and who adds to a not inconsiderable experience that enthusiasm in the practice of his profession which is so desirable in undertaking to fill a position whose principal emolument is the consciousness of duty faithfully performed. The appointment of Dr. McClelland, whose term had expired, as his own successor, is one on which his colleagues can but felicitate themselves and him.

The last Legislature showed its confidence in the board, and its satisfaction with the work accomplished by it, by continuing the appropriation for its support, and adding to its means of usefulness by greatly increasing the edition of its Annual Report, and also authorizing the printing of a large edition of

the Compendium of the Sanitary Laws of the Commonwealth, which its Committee on Sanitary Legislation has prepared. The Governor of the State has exhibited no less interest in its labors than his esteemed predecessor ; and its sister boards have proved themselves ready to co-operate with it cordially wherever opportunity has presented itself.

The outlook, therefore, is most encouraging for its increased usefulness during the coming year. A new element of strength has been added in the passage of the Bill for the Incorporation and Government of cities of the fourth, fifth, sixth, and seventh classes. Your Secretary was invited to appear before the Inter-Municipal Convention, composed of delegates from cities and boroughs from all parts of the State, assembled to deliberate upon this measure, and to give his views as to the proposed article, authorizing the establishment of boards of health in all such cities. As a result of this conference, certain objectionable features were eliminated from the bill, and a more direct relationship was established between the local boards and this board. When all the cities in the State have organized boards, with a complete system of registration, vital statistics will begin to take shape. The rural districts will not be content to allow the cities to reap all its advantages, or to allow their own people to be born and die with less official record than is made of their blooded stock. And thus gradually this board may hope to become the State Bureau of Vital Statistics in something more than name.

One of the duties imposed upon the board is to "suggest amendments to the sanitary laws of the commonwealth." In the discharge of this duty, the board presented to the Legislature for its consideration at its last session nine bills. Of these, three had for their object the establishing of the necessary machinery for the collection and record of vital statistics. One providing for the compensation of country registration officers, prothonotaries and clerks of orphans' courts, for making returns to this board ; a second, for the employment of an additional clerk in the office of the Secretary of International Affairs, to receive and collate those returns ; and a third, for the appointment of health officers of townships and counties who should act as registrars for births, deaths, and prevalent diseases. The system thus proposed would have

been a very complete one, and would have placed Pennsylvania in the foremost ranks of enlightened commonwealths in a matter which all statesmen now regard as of prime importance. The Legislature, however, while appreciating the advantages of the plan, evidently considered that public sentiment was not yet sufficiently advanced to sustain it in the creation of so large a number of salaried offices, for an object which to many would appear purely theoretical, and the bills failed in the Senate after passing the House. The three bills looking to a continuance of the work of the Board passed unanimously. Two of an extremely practical character, one "to regulate the transportation and storage of dynamite," and the other, "to prevent the pollution of rivers, lakes and other waters," were less fortunate, partly because introduced somewhat late in the session.

These objects, it is trusted, the Board will see the importance of keeping steadily in view, and of urging them upon the attention of the next Legislature, with such modifications as may remove the obstacles to their success.

One of the most important practical questions which now confronts the board, is that which it took occasion to present with all earnestness to the National and State authorities during the first year of its existence—viz. : The quarantine of the Delaware River. The presence of the most to be dreaded of all modern epidemic diseases in a neighboring port, and the possibility that any day may bring a vessel laden with its death-bearing seeds into our own waters, makes this problem one of the utmost urgency. The opinion, officially expressed on more than one occasion by the board, that the means now provided by the State authorities and those of the city of Philadelphia for the exclusion of Asiatic cholera and the management of a ship-load of infected emigrants are utterly inadequate, has just received the strongest possible confirmation from a committee of intelligent physicians, appointed by the oldest and most conservative medical society in the country. A kind Providence and no good management of our own has granted us immunity so far. But let us not tempt Providence. To idly hang our hands with so much of menace in the air is to play the part of imbeciles. Winter will not save us if the disease once gets a foothold.



Your Secretary recommends that the board urge upon His Excellency, the Governor of the Commonwealth, the importance of at once conferring with the chief executives of the neighboring States of Delaware and New Jersey, alike interested with this State in excluding infection from that great highway of travel and traffic, the Delaware Bay and River, with a view to making joint application to the President of the United States for the grant of such portion of the reserve fund placed in his hands by Congress for meeting emergencies like the present as may be necessary to immediately establish a National Quarantine Station, either at the site of the present Marine Hospital, at the Delaware Breakwater, on Pea-patch Island, which shall provide ample and comfortable accommodations for quarantine of detention and inspection, and for the care of the sick, as well as be supplied with all the modern appliances for disinfection of ships, cargoes, baggage, and clothing. A few thousand dollars judiciously expended in this manner during the next four months may be the saving of as many millions, which would otherwise be swallowed up in the devastating march of a pestilence. The city of Philadelphia will still have ample use for her stations at the Lazaretto. The Director of Public Safety is already, with wise foresight, urging the removal of the Municipal Hospital from its present site, in the midst of a rapidly-growing population, not far from the geographical centre of the city, to that more remote and isolated locality. The question of its removal some whither is only one of time. The city of New Orleans finds the possession of two stations, one at the mouth of the river and one nearer the city, a matter of great convenience, and our own situation, controlling the commerce of the river as we do only in part, makes such an arrangement still more desirable for us.

There cannot be a moment's doubt that the President would lend respectful attention to a request emanating from such distinguished sources.

It is also for the board, in its wisdom, to determine whether the time has not arrived when it should call upon the Surgeon-General of the Marine Hospital Service to use the authority vested in him by Congress to notify consuls of the infected Mediterranean ports that emigrants from such ports will not



be allowed to land in this country until competent authorities have declared the infection to be at an end in those cities.

An inspection of the Executive Mansion, made by the Secretary, in consequence of the death of one of its inmates from diphtheria, revealed sanitary defects of a glaring nature. It is to be hoped that compliance with the recommendations of the board will prevent a repetition of the sad events which have so often made the residence of our Chief Magistrate a house of mourning. There are, however, serious objections to the situation, which must eventually lead to the erection in some other part of the city of a building unexceptionable, from a hygienic point of view, and more commensurate with the dignity of a great commonwealth.

The action of the board, in adopting the "Annals of Hygiene" as its official organ, has been amply justified by the high standard maintained by that journal and its increasing popularity. The Superintendent of Public Instruction could confer no greater boon upon the rising generation committed to his charge than by placing a copy of it in the hands of every educator. A text-book of hygiene alone is not enough. The teacher needs something to stimulate his interest, and to bring the subject before him in an alive, every-day, practical manner, and this the journal in question will unfailingly do.

The absence of any law in this State for circumscribing and stamping out the disease known as glanders, or farcy, seems to make it incumbent upon the board to adopt a regulation covering that subject. An interesting conference has been held with representatives of the State Board of Agriculture in reference to it, and it is believed that the two boards can profitably act in concert in the effort to banish this horrible infection from our borders.

In conclusion, the Secretary begs leave to express to the board his sense of obligation to them for their hearty co-operation in every measure which he has deemed necessary for the public good, and their readiness to sacrifice time and devote labor which could ill be spared from busy lives in furtherance of the beneficent objects for which the board was created.

*Recommendations in regard to the care of infants* form the subject of an instructive circular issued by the Secretary of the board, comprehending especially the importance of clean-

liness, fresh air, proper clothing, nursing, and food as the most important measures for the prevention of diarrhœal diseases.

*Philadelphia* reports for four weeks ending September 24th 1451 deaths in a population estimated at 993, 801, of which 624 were under five years of age. Death-rate, 20.7 per 1000. From zymotic diseases there were 251 deaths, and from consumption, 177.

*Pittsburg* reports for four weeks ending September 24th, 339 deaths in a population estimated at 200,000, of which 153 were under five years of age. Death-rate, 21.0 per 1000. From zymotic diseases there were 82 deaths, and from consumption, 34.

RHODE ISLAND.—*Providence* reports for the month of September, 226 deaths in a population estimated at 121,500, of which 83 were under five years of age, representing an annual death-rate of 22.32 per 1000. From zymotic diseases there were 84 deaths, and from consumption, 21.

TENNESSEE.—The principal diseases named in the order of their greater prevalence in the State for September, were malarial-fever, dysentery, and consumption.

Typhoid-fever is reported in the counties of Campbell, Chester, Davidson, Fayette, Franklin, Hamilton, Hawkins, Jefferson, Knox, Marshall, Maury, Montgomery, Moore, Putnam, Robertson, Rutherford, Shelby, Sullivan, Sumner, and Wilson.

Whooping-cough in Hamilton, Humphreys, Montgomery, Moore, Overton, Putnam, Rhea, and Shelby.

Diphtheria in Davidson, Gibson, Hamilton, Jefferson, Knox, Marshall, Morgan, and Shelby.

Measles in Anderson, Jefferson, Lake, Moore, Overton, and Pickett.

Scarlet-fever in Anderson, Davidson, Gibson, Knox, and Shelby.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga, white,	14.50 ;	colored,	37.84 : 22.69
Clarksville,	“ 0.00 ;	“	28.00 : 10.50
Columbia,	“ 15.05 ;	“	00.00 : 8.47

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Knoxville, white,	13.05 ;	colored,	37.85 : 18.14
Memphis,       “	19.99 ;	“	46.09 : 29.26
Nashville,     “	12.04 ;	“	20.06 : 14.91

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The mean temperature was  $70^{\circ}.5$ , about the September mean of the past five years. The highest temperature was  $102^{\circ}$ , recorded on the 12th, and was several degrees above the highest recorded in September during the five years past. The maximum of  $100^{\circ}$  was recorded at several stations during the period of the hot wave, which existed during the second decade of the month. The lowest temperature was  $34^{\circ}$ , recorded on the 25th, at two stations, and was below the average September minimum. This cold wave was felt at all the stations on the 24th and 25th, and was followed by the rains of the 26th–28th. The highest monthly mean was  $77^{\circ}.4$ , reported at Austin, and the lowest was  $64^{\circ}.7$ , reported at Fostoria.

The mean precipitation was 2.70 inches, very nearly the September average of the past five years.

VIRGINIA.—*Richmond* reports for the month of September, 158 deaths in a population estimated at 100,000, of which 59 were under five years of age, representing an annual death-rate of 18.96 per 1000. From zymotic diseases there were 39 deaths, and from consumption, 19.

WISCONSIN.—*Milwaukee* reports for the month of September 293 deaths in a population estimated at 180,000, of which 106 were under five years of age, representing an annual death-rate of 19.5 per 1000. From zymotic diseases there were 107 deaths, and from consumption, 12.

CHOLERA.—From Surgeon-General Hamilton's Weekly Abstract of Consular Reports to the State Department, November 4th to 25th, deaths from cholera reported as follows :

*Naples* : September 27th to October 6th, deaths, 18 ; “ in the surroundings the disease has almost entirely disappeared.”

*Palermo* : October 2d to 23d, deaths, 17.

*Rome* : During the week ending October 15th, deaths, 16. Twenty to 25 cases in Lazaretto, and 100 persons who have been exposed in house of observation.

*Messina* : October 12th : epidemic of cholera broke out sud-

denly, September 10th and on the 14th, 256 were reported during the last 24 hours.

*Malta and Gozo* : During the month ending October 15th, deaths, 295.

*During the Third Quarter, 1887* : Deaths from cholera reported by the health authorities : Marseilles, 11 ; Calcutta, 594 ; Madras, 36 ; Bombay, 9.

SMALL-POX.—*Havana* : During the month of October, deaths, 250 ; three weeks ending November 12th, 166.

*Santiago de Cuba* : October 29th, epidemic almost entirely ceased. During the two weeks ending October 29th, 5 cases and 1 death.

*Guayaquil* : During the three weeks ending October 27th, deaths, 42.

*Cienfuegos* : During the three weeks ending November 7th, deaths, 6.

*Merida* : During the week ending November 8th, 1 death.

*Buenos Ayres* : During the month of August, deaths, 84.

*Rio de Janeiro* : During the three weeks ending October 1st, deaths, 423.

*During the Third Quarter, 1887* : Deaths from small-pox reported by the health authorities as follows :

London, 1 ; Liverpool, 1 ; Glasgow, 1 ; Sheffield, 46 ; Edinburgh, 1 ; Bristol, 2 ; Paris, 99 ; Lyons, 1 ; Marseilles, 4 ; Nantes, 1 ; Havre, 25 ; Reims, 1 ; Chemnitz, 1 ; Vienna, 7 ; Pesth, 18 ; Prague, 32 ; Trieste, 84 ; Cracow, 3 ; Presburg, 11 ; St. Petersburg, 45 ; Warsaw, 242 ; Saragossa, 44 ; Bucharest, 8 ; Cairo, 11 ; Alexandria, 1 ; Gaud, 1 ; Louvre, 2. During the *second quarter, 1887* : Rome, 63 ; Milan, 117 ; Turin, 17 ; Genoa, 16 ; Florence, 46 ; Bologna, 28 ; Padua, 2 ; Lisbon, 59 ; Buenos Ayres, 506 ; Bombay, 39.

YELLOW-FEVER.—*Tampa, Fla.* : During the four weeks ending November 23d, cases, 129 ; deaths, 32. Totals to November 23d, cases, 380 ; deaths, 71. The disease was also reported, November 11th, at *Manatee*, causing much alarm. At *Many Lakes*, two cases have been reported, but they were refugees from Tampa.

*Havana* : During the month of October the number of



deaths was 35. During the three weeks ending November 12th, deaths, 15.

*Cienfuegos*: During the week ending November 24th, the number of deaths was 2.

*Santiago de Cuba*: October 23d, the disease continued to prevail among the troops of the garrison, 9 deaths having occurred during the week ending on that day.

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## LITERARY NOTICES.

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CYCLOPÆDIA OF OBSTETRICS AND GYNECOLOGY. (Twelve volumes, price, \$16.50.) Volume V., containing: Gynecological Diagnosis; General Gynecological Therapeutics, by R. Chrobak, M.D., Professor of Gynecology at the University of Vienna; and, Electricity in Gynecology and Obstetrics, by Egbert H. Grandin, M.D., Obstetric Surgeon to the New York Maternity Hospital. With one hundred and sixty fine wood-engravings.

Volume VIII., Diseases of the Ovaries, by Dr. A. Ols-hausen, Professor of Obstetrics and Gynecology at the University of Halle. Thirty-six fine wood-engravings.

Volume XI., containing: Sterility; Developmental Anomalies of the Uterus, by P. Müller, M.D., Professor of Obstetrics and Gynecology at the University of Berne; and, The Menopause, by E. Börner, M.D., Professor of Obstetrics and Gynecology at the University of Graz. With fifty-nine fine wood-engravings.

Volume XII., containing: Diseases of the Tubes, Ligaments, Pelvic Peritoneum and Pelvic Cellular Tissue; Extra-Uterine Pregnancy, by L. Bandl, M.D., Professor of Obstetrics and Gynecology at the University of Prague; and, Diseases of the External Female Genitals; Lacerations of the Perineum, by P. Zweifel, M.D., of Erlangen. With one chromolithograph and eighty-eight fine wood-engravings. New York: William Wood & Company.

The above are the concluding volumes of one of the most complete and valuable contributions to the several subjects of which they treat hitherto published. The publishers' work is

in admirable keeping with the excellence of the matter ; paper, printing, illustrations, and binding, all conduce to the value of the work, and few medical practitioners can afford to do without it, no matter how well they may be supplied with other works on the same general subject.

THE SAVAGERY OF BOYHOOD is the striking title of an instructive article by John Johnson, Jr., to be published in the *Popular Science Monthly* for October, in which the author points out that, since a boy's development is an epitome of the development of the human race, he naturally passes through a stage when cruelty is so characteristic that a tender-hearted boy must be deemed diseased.

CAPTAIN GLAZIER AND HIS LAKE. An Inquiry into the History and Progress of Exploration at the Head-Waters of the Mississippi Since the Discovery of Lake Itasca. By HENRY D. HARROWER. New York and Chicago : Ivison, Blakeman & Co. This is an interesting pamphlet of 60 pages, with maps, inquiring into the validity of the claims of Captain Willard Glazier to having made important discoveries and explorations in the region of the head-waters of the Mississippi, with the result of exposing an attempted fraud on American intelligence and scholarship.

STATE MEDICINE. By AMOS G. HULL, Esq., President of the Society of Medical Jurisprudence and State Medicine, New York, Inaugural Address, January 13th, 1887. (Reprint from the *Alienist and Neurologist*, St. Louis.) A pamphlet of 12 pages, summarizing the papers and reports upon the subject of the title presented before the Society of Medical Jurisprudence and State Medicine during the preceding year, of which there appears to have been many, rather than attempting to add anything new to the subject.

PRACTICAL THOUGHTS FOR PHYSICIANS, by G. W. H. KEMPER, M.D., Muncie, Ind., is the title of an address delivered before Indiana State Medical Society, May, 1887, showing the dilution of the medical profession by incompetents, and the importance of a more elevated standard of medical education.

# THE SANITARIAN.

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TECHNICAL EDUCATION, COMMERCIAL TRAINING, AND SANITARY PROGRESS.

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ABSTRACT OF THE ADDRESS OF SIR DOUGLAS GALTON, CHAIRMAN OF THE COUNCIL, AT THE OPENING OF THE ONE HUNDRED AND THIRTY-FOURTH SESSION OF THE SOCIETY OF ARTS, LONDON, NOVEMBER 16, 1887.

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SIR DOUGLAS GALTON, in the course of his address, referred to the labors of three pioneers of social progress—Edwin Chadwick, John Simon, and Henry Cole—as having had an important influence during the Queen's reign in raising the people from a condition which we should now term one of semi-barbarism.

He pointed out that our sanitary difficulties were simply the result of the neglect of communities in past times to regulate the conditions of life in each village and town as it grew up, by enforcing rules which would insure that every dwelling should be so arranged as to maintain a pure soil, to be provided with pure air, to be supplied with pure water, and to enjoy the blessing of sunlight.

After indicating that the Society of Arts had been an active worker in the field of social improvement, he stated, as an illustration, that it had long taken a prominent interest in the spread of education. Among those of the society's members who contributed most largely to the education of the people, he singled out Rowland Hill, the originator of the penny post, and Milner Gibson, the persistent opponent of the tax on

paper. If they looked for the earliest and most striking feature of educational progress after the Queen ascended the throne most would, he thought, agree upon the penny post. It was a matter of pride to the society that their organization was used to a large extent to promote the penny postage agitation. Most of the subsequent important postal improvements had received impetus from discussion in the society, such as the parcel post, the purchase of the telegraphs, the reduction in the price of telegrams, as well as the International Postal Union. The society might, however, regret that its efforts had not yet succeeded in obtaining an ocean penny postage between this country and her colonial possessions.

For more than thirty years the Society of Arts had made the subject of education a part of its standing work. By means of the examinations it instituted the society was the forerunner of the efforts which had been made to promote technical education, its efforts in this respect being followed in 1877 by the city companies, who then took measures to establish a College of Technical Science, which had developed into the City and Guilds of London Institute. It had been long contended by the society that the elementary education now given was not entirely satisfactory, as failing to create a supply of boys fitted to take up at once the practical business of life. Mr. Edwin Chadwick and Dr. Richardson had long advocated the half-time system in elementary schools. The object of technical training was to develop in the best way the intelligence of those of all classes upon whom our industries depended. Hence this sort of training in elementary schools could not be of a uniform character throughout the country ; it ought to have some reference to the wants of the employers of labor in the district, so that the boys on leaving school might be prepared for their future occupations. It was satisfactory to know that the City and Guilds of London Institute was now co-operating with the School Board of London to try the experiment of technical training, combined with the ordinary elementary education, in six of the metropolitan schools. The proposal was to teach carpentry. It was understood that there was no deficiency of boys desirous to learn. Moreover, as an evidence of the interest which the teachers took in the movement, eighty teachers had gone through a course of



training in the Central Institution of the City Guilds in Exhibition Road, and another batch were coming forward so as to be qualified for assisting in teaching carpentry. It was obvious that the more they developed the preliminary training in boys, the more they fulfilled that important function of a school, of teaching the boy how to learn ; so that if real profit was to be derived from this increased education, they must perfect the means for further training after the board school had been left, by evening schools, by secondary schools, and by scholarships.

Probably the technical education question was now in a fair way of being solved. But in the branch of commercial training which the Society of Arts had endeavored for some years to promote, that progress had not yet been made, nor that success achieved, which their efforts might have reasonably led the society to expect. It would seem as if their examinations did not touch the class which would most benefit by opportunities for commercial training. Of the want of more systematic commercial training there could be little doubt. Improvements in the means of production would not alleviate commercial depression, unless markets were found for the cheapened products. The valuable Consular Reports, which were now periodically published, showed unmistakably that we lost trade, not always because we could not manufacture as well as our competitors, but often for want of knowledge of the places where markets for our goods might be found, and of the requirements of the markets, which it should be our business to satisfy. In dealing with the chief requirements of a commercial training, he pointed out that in addition to the elements of a good English education, the most important consideration was that of foreign languages, which must be taught especially in relation to the commercial expressions used. Next would come instruction in commercial geography ; but competent teachers of this might be said as yet scarcely to exist. Then came the question of commercial museums, which should be found in all higher elementary and modern secondary schools. In the higher elementary schools book-keeping should be taught as a branch of commercial arithmetic, and in these and higher schools instruction should be given in the principles of political economy. Evening

classes should afford opportunities for practice in speaking and writing foreign languages, and should supply good instruction in commercial arithmetic, book-keeping, shorthand, and commercial geography.

Dealing next with the question of sanitation, he said the Society of Arts had for many years taken a prominent position in regard to it. With reference to purity of air, he stated that their former Chairman of Council, Sir W. Siemens, whose early death was a serious loss to the nation, was actively interested in efforts to preserve the purity of the atmosphere in towns by the prevention of smoke. They had had that day a very good illustration of the need of such efforts. The adulteration of food had been a frequent subject of discussion. But the question of sanitation did not end with drainage and water-supply ; it involved those further considerations which the works of Edwin Chadwick and John Simon had just lately brought prominently forward. Among the more important of those questions, there still remained for solution the question of the housing of the poor, which lay at the root of many of our social difficulties, and, indeed, the great question of poverty itself. The existing laws would do much if properly enforced, but London was a federation of parishes, and except for certain purposes had no unified administration. In some cases, parishes were poor ; and in other cases, personal interests of members of vestries might militate against enforcing the law ; and all past experience seemed to show that until London had been provided with a municipal government the social improvements which other towns were perfecting must lag behind. No landowner should be permitted to erect houses on a town site, unless they were so arranged as to have a due circulation of air front and back, and a due proportion of sunlight ; and the height of buildings in towns should be so regulated that they should not unduly shut out sunlight from neighboring houses.

As to the notification of infectious diseases, he showed that while there were several towns in Great Britain which had obtained powers in local acts requiring that all cases of infectious diseases should be immediately notified to the authorities, there was no compulsory notification of infectious disease in the metropolis. By law the Asylums Board had intrusted to it

the duty of removing and isolating one class of patients only—viz., the infectious sick poor. They possessed no power, either of ascertaining the general extent of any epidemic among other classes of the community, or of compelling the isolation of the patients of those classes; nor was there any enforced examination of the sanitary condition of premises where outbreaks of disease had occurred. There was at the present time a serious epidemic of scarlet-fever in the metropolis. This epidemic was increasing daily in extent. But many of the cases which came into the hospitals of the Metropolitan Asylums Board had been suffering for some time from the disease, and had during that time undoubtedly been spreading the infection around them among the public; hence the limited degree of isolation afforded by the hospitals of the Metropolitan Asylums Board appeared to be of little avail to check the disease. He mentioned this as a practical instance of the small value of expensive isolation hospitals in the absence of power to compel the notification of all cases of infectious disease. But he was happy to think that a movement was now on foot in London to endeavor to induce the Local Government Board to obtain power from Parliament to enforce the notification of infectious diseases in the metropolis.

The problem of how to cope with poverty, and how to find means of employment for our rapidly increasing population, called for the serious attention of statesmen more than any other social problem at the present time. While they might do much by well-directed efforts to raise the character of the laboring poor, and to develop, by wise legislation, new resources, and open out new channels of employment for the people, there would still remain a residuum, which was influenced by no desire of bettering itself, the members of which would only do as much work as would enable them to get sufficient beer and tobacco, and whom no large employer could advantageously employ directly. The only way in which work could be obtained from such laborers was by sub-contractors, who had a personal interest in their hire, and were thus somewhat in the position of slave-drivers, and they contrived to make this class do a modicum of work.

Dealing next with quarantine, he referred to the discussion of the subject at the International Hygienic Congress at



Vienna. Without arriving at any conclusion as to the extent to which cholera contagion might be conveyed, the discussions at that Congress showed the universally prevalent feeling to be that quarantine was ineffectual to stop the march of cholera, but that its progress was determined entirely by the unsanitary conditions it met on its way. But the remark was made, "You English have, by your sanitary improvements, prevented cholera from gaining a foothold in England; why do you not attack it in its birthplace, and prevent it from springing into life in India? If your Indian ports were not affected with cholera, quarantine against India would fall of itself." We might well ask ourselves why had we done so little for the sanitary improvement of Indian populations. It had not been for want of knowledge. In 1860 a Royal Commission presided over by Lord Derby made several recommendations. Sanitary Commissions had been appointed, and they had collected in twenty-five years a vast mass of information which all pointed one way. Where there was damp, dirt, and bad water, cholera, as well as the still more deadly fevers, thrived; where these favoring conditions were wanting, cholera and many other preventable diseases did not exist. Referring to the colonial part of the society's work, he said the Colonial Institute had, to a great extent, relieved the society of that part of its work.

The Colonial Institute was created for the exclusive consideration of questions affecting the colonial interests of the empire, and it had been most useful in pushing forward the question of how best to cement the union of the colonies with the mother country. That question had now received a great additional impetus from the action of their president, the Prince of Wales. He had inaugurated the Imperial Institute, which, if it realized the aspirations of its founder, would bring the people of this country into closer relations with their colonial brethren, not only by giving to all classes in this country the opportunity of becoming practically conversant with the products, the resources, and the conditions of life in the several colonies, but creating, as it were, a colonial exchange. It would thus afford to their colonial brethren a place where their respective wants would be authoritatively set before the people of this country and of the other colonies. It would also draw



into one focus, and largely intensify the scattered efforts, which were now being made in various dependencies, to advance scientific and practical training, and promote, in a consistent manner, the social progress of the whole of the huge federation of States which constituted the British Empire.

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## NATIONAL GAINS BY SANITATION.

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MR. EDWIN CHADWICK being, from his age and infirmities, unable to attend the Sanitary Congress at Vienna as President of the Association of Sanitary Inspectors, forwarded to the President of the Congress, His Imperial Highness Prince Rudolph, congratulations on the corroboration of sanitary principles in that part of his opening address wherein he stated :

“Man is the most precious capital of the State, and of society in general. Every individual represents a certain value. To preserve this as intact as possible to its furthest limit is not only a command of humanity, but also the duty of every community in its own interests.”

To aid the estimate of the money gain to Austria by sanitation, Mr. Chadwick transmitted the following data for adaptation there, as derived from English experiences :

The death-rate in the Austrian army was stated by Professor Sormani to the Congress of Geneva at 11 per 1000. The death-rate in the German army appeared then to be 5 per 1000. In the English home army it was then 8.17 per 1000 ; it is stated in the last Army Medical Report to be now got down to 6.68 per 1000 for the United Kingdom. At the English estimate, the value per man lost was £100 each, added to which was 42 days of sickness per man. It may be confidently stated that by the strict application of sanitary science the death-rate of the Austrian army may be reduced by 5 per 1000. This would give a gain of 5000 of force per annum on the million kept on the war footing, with a saving, on the English rate, of £100 per man.

Besides this saving, sanitary science would give a saving of 42 days of sickness per man, at the soldier's day's pay, 1s. per diem, making a total saving of money of £510,000 per annum.

The death-rate of the civil population in Austria was recorded as 29 per 1000 in the years 1883 and 1884. In Hungary, in the same years, it was 32 and 31 per 1000. In Great Britain it was 21 per 1000 in those years. It has now been got down to about 19 per 1000. There could be no doubt that the death-rate of the civil population in Austria might be reduced by at least 5 per 1000 on the 37,000,000 of population (exclusive of the army on the war footing). This would save in money nearly £28,000,000 per annum; on the death-rate on Dr. Farr's estimate for England, say at £150 per head, denoting in the case of the adult a gain of twenty Austrian days' wages. The reduction of the death-rate, it is to be understood, is attended by an augmentation of the life-rate. Examples in England show a power of the sanitary factors of an augmentation of the duration of life in Her Majesty's reign from 30 to 38 years. With the wage classes it shows an increase of upward of five years, chiefly in the late periods of life, or a gain of five years of working ability and a gain in wages.

In his address as President of the Health Section of the International Exhibition, Sir James Paget showed that the insurance charges of friendly societies in the United Kingdom of excessive sickness, of loss of work, and of premature mortality, were covered by insurance charges of not less than £24,100,000 per annum. From the heavier general death-rate of Austria, it may be expected that such charges are not much less there. We know that by competent sanitary administration in England that these heavy insurance charges are reducible at a considerably less expense for properly constructed works on the separate system.

In the largest and the best of our District Orphan Schools on the half-time principle of mixed, manual, and industrial, as well as mental training principle, of those who enter without developed diseases upon them—the "children's diseases" as they are called—whooping-cough, measles, scarlatina, and typhus are now practically abolished, and the death-rates, even with children of the lowest type, are reduced to less than one third of the common children's death-rates; while the efficiency of three is given to two children for industrial occupations at increased wages. Such results, it will be

found, are more readily obtainable for elementary educational institutions, than the sanitary-structural arrangements for large towns.

The death-rate in the army of Italy is stated to be the same as that for the army of Austria—namely, 11 per 1000, or double the death-rate of the German army. The death-rate of the civil population of Italy appears to be about 27 per 1000, and the gains obtainable by efficient sanitation of Italy in nearly the same proportions as for the civil population of Austria.

The greater part of the items of the mortuary statistics denote preventible pains and agonies which, if they occurred separately and distinctly, with passion and violence and bloodshed, would rouse populations for redress. We may now, however, by the progress of correct sanitation, make our only object the saving of money from the wastefulness of ignorance, and proceed, by the levy of rates upon occupiers (who derive the benefits), to effect a three or fourfold reduction of insurance charges, as well as a saving of life, of working ability, and an increase of wages, by the correct action of the "Separate System," as displayed in papers I have written to correct the shortcomings and expose the fallacies of communications made at the recent Sanitary Congresses.—*Sanitary Engineering*, November 4, 1887.

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## ZYMOTIC DISEASE IN ITS RELATION TO SANITATION.\*

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By GERARD G. TYRRELL, M.D.

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IN endeavoring to trace the relations that exist between the commonly called zymotic diseases and sanitation, it may be necessary to define what we mean by zymotic disease, and what is included in that term. Dr. Dunglison, in his dictionary, defines it as any epidemic, endemic, contagious, or sporadic disease, which is produced by some morbid principle acting on the organism similar to a ferment. The late Dr.

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\* Read before the Sacramento Society for Medical Improvement.

Farr defined zymotics as possessing the property of communicating their action, and affecting analogous transformations in other bodies, and would use the word to include endemic, epidemic, and contagious diseases. Later observers have objected to the definitions of both Drs. Dunglison and Farr, and from the new light shed upon disease causation, we evidently must very soon abandon the term zymotic, as applicable to those forms of disease which are known not to be the result of a fermentative process within the body, but are the product of a well-defined cause, which is demonstrable as the result of infection or contagion from any source of either animal or vegetable origin.

We will therefore in this paper use the term "communicable" as most applicable, and being most expressive in defining the class of diseases in which sanitation plays no small part in their prevention. As it is generally admitted in these days that the process known as contagion, by which diseased conditions of organized bodies are communicated to other bodies, is neither gaseous nor liquid, but either solid or semi-solid, it therefore becomes a matter of legitimate inquiry as to the nature of these bodies which are capable of producing the dire effects so noticeable at times in all communicable diseases. Of one thing we may be assured, and that is that these disease germs are living bodies, but when we enter upon the nature of these agents we encroach upon disputed ground. Mr. John Simon makes two classes of living contagia—viz., parasitic and metabolic. By the former he means those animal and vegetable intruders which produce diseased action simply by preying upon the aliment and blood of their host; so the whole tribe of entozoa, trichina, acarus scabei, and numerous skin affections dependent upon microphytes. Their effects are not specific or general, except in derangement of general nutrition; they have no definite period of operation, but continue their ravages until either they are destroyed or their victim perishes; hence they are not contagious in the proper sense of the term.

The second class of Simon operate by producing changes in the structures affected—the blood, the cutaneous, mucous, and cellular membranes, and glandular organs—of a destructive character, deranging their functions, disturbing the proc-



esses of nutrition, of circulation, of calorification, and of secretion. Fever, loss of appetite, emaciation, prostration of the muscular and nervous forces, are the usual results. This class includes what are commonly known as zymotic diseases.

Of the nature of these morbid agents, three theories have been promulgated :

First. The vital form theory advocated by Dr. Lionel Beale.

Second. The nervous theory, whose exponent is Dr. W. B. Richardson, and

Thirdly. The microphyte theory, at present rapidly gaining ground among recent observers.

To briefly review these theories may be interesting : Dr. Beale uses the term bioplasm to designate the physical basis of life and growth. This consists in his view of separate particles of matter less than one thousandth of an inch in diameter, originating in the blood, and destined for the nourishment and growth of all the tissues in the body. Microphytes are considered by him as the lowest form of bioplasm, existing in all the fluids and solid tissues of both plants and animals, as well as all kinds of mineral substances, and under all meteorological conditions, though dormant under some conditions of temperature and dessication. Being omnipresent and, as he believes, undistinguishable from each other by any precise physical characteristics, he denies their relation to disease of any kind.

Contagious diseases are attributed by him to degraded or perverted bioplasm descended from originally healthy bioplasts ; these constitute what he styles " disease germs," which have the property of self-multiplication like healthy bioplasts, both within the diseased body and in any susceptible body to which they may gain admission. He does not claim that there is any means by which a healthy bioplast can be distinguished from a diseased one except by the consequences. Hence the hypothesis, having neither physical facts nor analogy to sustain it, must fall to the ground.

Dr. William B. Richardson believes that true contagia are all of glandular origin, and he gives the venom of serpents as a type of their source and action ; he believes that any animal secretion might be made to yield a contagious principle to which he gave the name of " septine" and the maladies sep-

tinous. The effect depends not on the multiplication of germs, but is catalytic. The agent changes other substances without changing itself.

The poison, therefore, is reproduced only in the infected and diseased body through its own secreting organs. He believes, also, that ordinary secretions may change character and become poisonous without previous infection.

As he maintains that communicable diseases may arise without intervention of contagious matter, he supposes that the virus may arise through nervous impressions upon glandular organs, and refers the origin of such cases to fear or anger when no mode of communication can be discovered.

The last hypothesis attributes contagious disease to the agency of microbes or minute living objects. By most authorities they are classed in the vegetable kingdom, and might be termed microphytes of the fungus order, being for the most part destitute of pigment. The general resemblance between symptoms of contagious disease and the processes observed in the fermentations, and the discovery of the dependence of the alcoholic fermentation upon the yeast plant, naturally led to the search for similar organizations in the blood and other secretions of persons suffering from communicable disease. It was this supposition that gave rise to the terms zymosis and zymotic. Research in this direction has proven most valuable in extending our knowledge of contagious disease, and every day we are apparently drawing nearer and nearer to the solution of those questions that have necessarily puzzled our forefathers in medicine for hundreds of years. The microphytes so far discovered are all classed under the generic name of bacteria, which are again generally classified as micrococci, bacilli, and spiro-bacteria with spiral filament. Multiplication takes place by fission and through spores, which latter show wonderful vitality under circumstances inimical to growth. If we trace the life history of these bacilli we find many of them quite innocent. Traube and Gscheidlen came to the conclusion, as the result of their experiments, that the living blood tissues have the power of destroying micro-organisms.

Wyssokowitsch found that very soon after injection there was a partial or complete disappearance of the micro-organisms from the blood. The saprophytic or non-parasitic bacteria

disappear most quickly, none being present in the circulating blood after three hours, at most, even although enormous numbers were injected; and even if bacteria are employed that are pathogenic for the animals experimented upon, they diminish in numbers very rapidly, and even for a time disappear, but in a variable period they reappear and gradually increase in numbers until death occurs. Dr. Watson Cheyne, in his paper upon bacteriology, is of the opinion that even non-pathogenic bacteria may produce in the intestines poisonous substances that can and do give rise to illness, diarrhœa, and even death. The generally accepted pathology of cholera is that the intestinal canal is the seat of the virus which grows there, and produces a poison, upon the absorption of which into the circulation all the other symptoms depend. In order to demonstrate the relation that exists between communicable diseases and sanitation, it becomes necessary to examine as carefully as possible the views of those who have made the natural history of these micro-organisms their especial study, as whatever view we take of the truth or falsity of these statements will materially influence us in our treatment and prophylaxis of the disease. Let us take diphtheria, for instance. Cheyne believes that this disease is purely local in its origin, in which assertion he is supported by Loeffler, who further believes that diphtheria proper is the result of a bacillus. This micro-organism grows in the superficial layers of the mucous membrane, and rapidly extends along the surface. As the result of its growth a large amount of fibrinous exudation is thrown out, and the cells in the affected mucous areas die.

The constitutional disturbance seems to be due entirely, at any rate in the first instance, to absorption of chemical products from the local growth, and not to the entrance of the living virus into the blood. Loeffler did not find these organisms in the blood vessels or in internal organs, except in two instances, where they were present in the alveoli of the lungs and in the liver. Loeffler ascribes their presence to post-mortem changes. Klein believes that the bacilli of diphtheria have the property of multiplying in the human blood, producing a septicæmia. At all events, the remarks of Hirsch, "that from the point of view which the science of the moment assumes in looking at the nature of the specific cause of diphtheria, the theory of its

autochthonous origin would certainly seem to be untenable unless we are to give up the principle of *omne vivum ex vivo* in so far as concerns the world of living things which are placed at the lowest steps of the developmental ladder," seem warranted.

Having this evidence that diphtheria is the result of a specific germ, a living microphyte, we are in a position to investigate its habitat, and perhaps destroy it in its home. The same remarks may apply to erysipelas, the micrococci of which have been shown to be the cause of the disease, and which seem to spread in the lymphatics of the skin. They have not as yet been found in the blood, although the constitutional symptoms in this disease are well marked.

Dr. Cheyne is of the opinion that in *typhoid-fever* we have in the first instance a purely local affection, the infection probably commencing from the intestine. The bacilli, in the first instance, seem to penetrate into and grow in the lymphoid follicles of the small intestines, leading to swelling and ultimately to ulceration of Peyer's patches and the solitary glands. After a time the bacilli, carried along by the lymphatic to the mesenteric glands, seem to penetrate into the blood, and are found, in the great majority of cases, in the form of plugs in the blood vessels in various organs, more especially in the liver, spleen, and kidneys. In *scarlet-fever* we have a form of poison closely allied to diphtheria and tonsillitis, and probably dependent upon a specific bacillus, the nature of which has not as yet been conclusively demonstrated. The same may be said of measles and parotiditis.

On the whole, then, without instancing other forms of contagious disease, we may come to the conclusion that all communicable diseases are the result of specific infection that is not autochthonous, and consequently can in a great measure be prevented. This can be done only by the hygienic care of persons and their surroundings, in methods of prophylaxia and disinfection, and in the isolation and nursing of the sick. Bacilli and their spores are very tenacious of life. We, therefore, are naturally anxious to ascertain what conditions aid or retard their development, as upon our knowledge of these and other questions in the life history of these cryptogamic plants much of our success as sanitarians depends.



In the first place, we find that bacilli that do not form spores die much sooner than spore-forming bacilli. As far as can be ascertained, the bacilli of diphtheria do not form spores, and they can be destroyed at a temperature of 140° F.

Secondly, we find that these bacteria grow in materials other than the blood of man and certain animals; hence can be cultivated outside the body—in the filth of rooms, polluted water, and in polluted soil, with a proper temperature and sufficient moisture. Pasteur found that the virus contained in a culture fluid decreased in virulence through lapse of time; the spores, however, resist the influence of time. He found by further experimentation that it was the presence of oxygen in the air in contact with a culture fluid whose constituents had become exhausted that caused the attenuation. He further found that spore-producing bacilli do not spore or seed until a certain temperature (113° F.) is passed, and that the spores retain the degree of virulence peculiar to the bacterium, from which they are derived.

Koch has shown that the method by which a virus is introduced into the body greatly alters its effects. Thus a bacillus anthracis introduced into the stomach of a sheep is harmless, but that a bacilli with spores introduced in the same manner may produce death. In this way may be accounted the fatality of bacillus anthracis in grazing cattle, as it is a well-known fact that the moist earth produces spores in abundance, and these, getting upon the herbage, gain access to the stomach and kill. Koch concludes that the juices of the stomach are capable of destroying non-sporing bacilli, and hence the immunity which is enjoyed by those who unconsciously swallow bacilli in large numbers. If this were not so, few of us would escape communicable disease. Without introducing any further evidence as to the nature of the micro-organisms capable of producing communicable disease, we have good authority for believing that they can be grown and nourished outside the body; that they are particulate, and capable of transmission by earth, air, or water; that in favorable media they multiply with amazing rapidity, and that some of them, of themselves harmless, by their wonderful proliferation die in the tissues, and by their decomposition give rise to poisonous compounds, which, by diffusion, may become speedily fatal.

We are still, however, but on the threshold of bacteriology, and what is now simply conjecture or probability will, before very long, be either indisputably verified or as positively denied. We have, nevertheless, the assurance that Nature has so organized our bodies that, placed in a sanitary condition, the tissues will resist any ordinary morbid tendency. There must be a condition of receptivity before disease will follow exposure; hence our health, as far as our personal habits are concerned, is within our own keeping. But, unfortunately, it is often impossible to guard against assaults from diseases that are invited and fostered by our less particular neighbors, who are believers in the beneficence of the Almighty rather than in the axiomatic truth that "cleanliness is next to godliness." The practical results of our knowledge upon the communicability of disease and its prevention have been well shown by Dr. Baker, of Lansing, at the last meeting of the State Medical Society of Michigan. He said in 102 outbreaks of diphtheria, where isolation or disinfection, or both, were neglected, the average losses per outbreak were a little over 16, and the average deaths were 3.23; while in 116 outbreaks in which isolation and disinfection were both enforced the average cases per outbreak were 2.86, and the average deaths were .66—indicating a saving of over 13 cases and 2.57 deaths per outbreak, or 1545 cases and 298 deaths during the year by isolation and disinfection in the 116 outbreaks, compared with those in which little or nothing was done.

The poison of diphtheria being, as a rule, ærobic, it is inhaled and commits its ravages in the respiratory tract, the nostrils, fauces, larynx, trachea, and bronchial tubes. Its relations, then, to sanitation are very close; whatever is a source of impurity in the air we breathe renders us liable to disease by depressing the vital forces and weakening the normal resisting power of the individual tissue cells. Diphtheria once established can be propagated by close proximity to the patient, by his breath, by kissing, by the bedclothes or articles used about the patient, from the expectorated matters, the excreta, from the false membrane itself, and from the body dead from diphtheria. Water contaminated with the germ, infected milk, sewer air, domestic animals, ochlesis, all manner of dust or dirt are capable of carrying and developing the

diphtheric germ. Hence, it follows that perfect cleanliness, with thorough disinfection of all suspected places or things, is our only safe reliance against diphtheria.

Typhoid-fever is not so easily prevented ; being an anærobic germ, it is swallowed in food or drink, oftenest in water, and flourishes and multiplies in the digestive tract and alimentary canal. Dr. Murchison believed that the disease might arise under certain favoring circumstances, "*de novo*," or, in other words, spontaneously from the decomposition of certain organisms.

The general belief now is that typhoid-fever cannot originate without the presence of a specific germ, and we find that the sanitary relation of typhoid-fever is to filth. In privies, in cesspools, in filthy drains, in polluted air, earth, and water typhoid-fever finds its peculiar culture grounds. There the germs grow and multiply ready to invade the sanctuary of life at the first fitting opportunity. In those cities where sanitation is most vigorously enforced, there we find the minimum of cases ; where sanitation is neglected typhoid-fever is a constant guest.

*Scarlet-fever* and measles poisons are both considered æri-form ; their exact relation to disease germs has not been definitely settled ; it is, however, beyond question that the poison is carried in the atmosphere and communicable by clothing, articles of food or drink, etc. Isolation and perfect disinfection, with removal and destruction of all sources of contagion, will prevent the diffusion of the infective material, and thus limit the spread of the disease. The sanitary relations of the micrococcus of erysipelas is still open to discussion ; it is at present believed to be ærobic ; its especial habitat, having once gained admission to the body, is in the lymphatic vessels of the skin, and has not thus far been discovered in the blood.

The cholera germ, the common bacillus, gives the very strongest evidence of the relation which sanitation bears to communicable disease. As far as is known of the cholera germ, it does not form spores, and, therefore, has not the resisting power to measures taken for its destruction as those micro-organisms whose strength lie in their spores. It is important, then, that all germs be destroyed before they occupy soil suited to their development, which is found in sewers, cess-

pools, and foul matters and places generally ; being considered anærobic or particulate solid, it is swallowed in food or drink, especially water. Cheyne says it grows and multiplies in the contents of the small intestine, and there gives birth to an intense poison, which, being absorbed and taken into the blood, produces all the other symptoms.

It therefore follows, as a natural sequence, that if these poisonous products are destroyed by germicides as they leave the body they become innocuous to others, or if parties having the disease are perfectly isolated and kept from polluting the water or the soil the disease can be exterminated. This was shown decisively during the cholera epidemic in Naples and in Spain. There it was found that in those towns where water was taken from unpolluted sources, and the places kept scrupulously clean, the inhabitants escaped the disease completely. In England, although cholera was introduced upon several occasions during the same epidemic that was devastating Spain and Italy, it was in each case by proper sanitation kept within the bounds of its original source, isolation and disinfection being the chief instruments used in its destruction. The discoveries of the last few years in the etiology of communicable disease have given such an impetus to sanitation that it is becoming apparent to the most superficial observer that he will be considered the most skilful physician who can prevent disease rather than he that cures it ; and it is a fact placed beyond doubt that many of the communicable diseases which in former years claimed their victims by the thousands, and were looked upon as the just retribution of an offended God, are now shorn of their terrors and placed in a great measure under human control. The Registrar-General of England has recently demonstrated that at the end of the last five years no less than two hundred and eighty-one thousand persons survive whose deaths would have been recorded had the mean rate of mortality been equal to the previous ten years : a gain of life of two years to every male child born, and three and one half years to every female child born in that country. With such a result as this from efficient sanitary work in England, what may we expect in America when sanitary reform becomes universal, which it will be in time. The Hon. Erastus Brooks, in an address before the State Board of Health of



Pennsylvania, when speaking of the power of the State Government over the health of the people, touches the key-note of success when he says, "Epidemics are to be treated like public enemies, and often they are worse than armed foes, because more insidious and often beyond observation. They come in the foul, sewage-polluted streams, and wells of water corrupted by closets and cesspools. They come like a thief in the night and steal away those jewels of the household, the little ones, whose lives are more precious to their owners than all the wealth of the State."

It is our duty, then, as medical men, to recognize this preventive power which exists toward communicable disease, and by addressing ourselves to the study of the life history of these poisonous germs, be prepared to fight these enemies of the human race in their own strongholds, by depriving them of the pabulum upon which they feed and multiply, so that they will die from want of sustenance; or, by the power of efficient germicides, kill them as they emerge from the culture beds, and thus prevent their spread to the detriment of humanity and the mortification and humiliation of ourselves, who are supposed by the public to be the conservators of health and the preservers of mankind.

The relation of sanitation to zymotic or communicable disease is, I believe, even more intimate than we now imagine; and although we must unqualifiedly reject the doctrine of abiogenesis in relation at least to contagious disease, yet it may be possible that we might have to admit what Milne Edwards has called xenogenesis, and believe that the common bacteria, under suitable unsanitary conditions, may acquire pathogenic qualities which would render it capable of engendering disease; and if such heterogenesis should ever be proven to be the fact, it is very evident that our only source of safety and self-protection would be in the practice and the profession of perfect sanitation.—*Pacific Medical and Surgical Journal*.

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THE NEW TREATMENT.—According to our Buffalo contemporary, Mrs. De Boffin says her son Jakey has a cough. The doctors examined his expectation with a telescope, and found it full of common Priscillas; then they dejected his rinctum with carbolic-acid gas, and now he is improving.

## A SOLUTION OF THE SEWAGE DIFFICULTY.

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### A SYSTEM OF SEWAGE DEODORIZATION AND PRECIPITATION WITH FER-CHLOR.

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By RICHARD WEAVER, C.E., F.C.S., Sanitary Surveyor, 24, High Holborn,  
London, W. C.

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THIS agent is essentially a chlorinated compound of the higher oxides of iron, and possesses the remarkable property of parting with a portion of its nascent oxygen in presence of putrid organic matters, or of matters approaching putrescence, and has little chemical effect upon organic compounds in a fresh state.

Having accomplished its work upon the sewage waters or other foul liquids, it then gathers up and reabsorbs oxygen, either from air dissolved in the fluids, or by splitting up water into its elements, for its own reconstruction, in readiness again for further duty, and so on in perpetuity.

This regenerative feature of the Fer-chlor indicates a new departure in the treatment of sewage, that might be more economically and usefully dealt with nearer the sources of production—viz., the sewer and drain heads, in preference to awaiting arrival at the outfalls, by which means its defecating powers are utilized throughout the lengths of the sewers, with the manifest advantages of abatement of local nuisances in the streets, by maintaining the sewage in a fresh and innoxious condition to the final outfall or place of ultimate disposal.

Although advantageous thus to get as much useful work out of the Fer-chlor as is practicable by its early application as suggested, nevertheless, if circumstances require the treatment to be effected at the outfall, then the defecating agent may be used at the settling tanks in the customary manner, with the advantages of prevention of secondary decomposition in the effluent waters and sludge, coupled with fixation of manurial matters in the sludge.

In the former mode of treatment, on arrival at the settling tanks mere subsidence is sufficient to bring about defecation and clarifying of the sewage, as the Fer-chlor previously suspended in the liquids gradually settles, carrying solid particles with it.

The Fer-chlor has no solvent action upon solid organic matters, as lime hydroxide has to the detriment of the effluent sewage; on the contrary, it possesses a chemico-mechanical effect upon soluble organic bodies that are precipitated. Therefore, if the defecating agent, Fer-chlor, is employed in sufficient quantity, then more of the organic matters in solution are precipitated to the evident improvement of the effluent waters. There is no objection to this precipitating and throwing out of solution action occurring within the sewers, however distant from the outfall the admixture of Fer-chlor with sewage may take place, as the effect is to somewhat thicken the sewage, and actual settlement does not begin until the mass arrives at a place of rest, such as the outfall tanks.

For the ordinary purposes of defecating house drainage, for street watering, for local application, such as to offensive drains and sewers, and the numerous employments to which deodorizers are applied, the Fer-chlor is in every way more efficacious, as well as cheaper than the usual commercial disinfectants, in regard to which Dr. E. Klein, F.R.S., the eminent bacteriologist, has aptly described them as perfectly useless for true disinfection.

The Fer-chlor is prepared from a variety of easily obtainable materials, and among others from the waste products of certain manufactures, so that when required in quantity it may often be prepared on the spot for sewage treatment at a cheap rate. Those who have studied the sewage question will readily comprehend that the elements of cost must necessarily vary with the particular sewage to be treated, and the degree of purification desired to be effected. Nevertheless it may be said in regard to the application of Fer-chlor, that the expense will in no case be greater than experience at any town shows there to be a customary or average rate of cost, while in the majority of places it may probably range from one half to three fourths of such usual charges.

Therefore, in addition to the more perfect treatment of

sewage than by any process yet tested, there is reasonable probability of the cost of defecation in many places becoming substantially reduced by employing the Fer-chlor due to its recreative properties, and moreover with the further benefit of a manageable and inoffensive residual sludge with its manurial ingredients fixed.

In regard to the physiological action of Fer-chlor upon bacterial life, owing to the peculiar selective powers on microbes, it is found to exert a destructive effect upon the pathogenic and putrefactive organisms, but to have no injurious result on the common moulds, and the nitrifying and healthful bacteria which grow in its solution. In this respect the Fer-chlor resembles in a lesser degree the more powerful but costly iodate sanitary salt employed for surgical and domestic purposes, and this characteristic explains the restraining properties of the new compound on organic matters in preventing secondary decomposition in the sewage effluent and sludge, thus permitting of the progress of natural disintegration, unattended by offensive and injurious putrefaction, whatever may be the mode of final sewage disposal.

The advantages of the system of Fer-chlor as a sewage purifier may briefly be summarized as follows :

1. Prevention of nuisances in the streets and thoroughfares by emission of foul gases and vapors generated within the sewers from putrefaction of sewage.

2. Prevention of nuisance in house drains and their equipments.

3. Complete oxidation of putrescent organic matters combined with precipitation of organic matters in solution.

4. Precipitation in the settling tanks by simple subsidence and freedom from offensive smells during the operation.

5. Prevention of secondary decomposition in the sewage sludge and fixation of nitrogenous compounds, thus securing whatever manurial value the sludge may possess, and avoidance of offensive odors in the process.

6. Arrestment of secondary decomposition in the effluent waters.

7. Economical treatment of sewage and at less cost than by usual processes, combined with greater efficiency due to the recuperative action of the Fer-chlor.



8. Restraining effect upon disease and putrefactive micro-organisms, but without injury to the harmless and beneficial bacteria.

9. Avoidance of material alterations in the existing arrangement of sewage works, and equal adaptability of the process to towns discharging sewage into the sea or water-courses, or by irrigation of land.—*Builders' Reporter and Engineering Times.*

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## THE TOBACCO POISON.

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TOBACCO is a potent acro-narcotic poison ; in fact, it is one of the most powerful poisons known, its prominent principle—nicotia—ranking next to prussic acid in the intensity and rapidity of its poisonous action ; “but the minimum fatal dose is unknown,” it is so small. Its vapor emits such a powerful odor of tobacco, and is so irritating and suffocating, that it is difficult and dangerous to breathe in a room where one drop of it has been spilled. Small animals perish from its odor, and a single drop killed a dog. In from two to five minutes, in poisonous doses, it is said to destroy life in man. In greater or less proportion it is necessarily inhaled, and exerts its baneful effects proportionately in smoking. Other toxic constituents of tobacco are nicotianin, almost equally poisonous with the former, and a deadly empyreumatic oil that collects in the pipes of smokers, one drop of which, introduced into the rectum, has killed a cat, and two drops a dog, in from five to six minutes, and doubtless also, more or less rapidly, many human beings from its inhalation and accidental imbibition, and with the concomitant nicotian principles is still more dangerous, the union of the three forming a most virulent poison. Besides these, in tobacco smoke Vohl and Eulenberg have found ammonia, prussic acid, creosote, colodine, sulphuretted hydrogen, formic, butyric, and carbolic acids, with various other noxious agents. Tobacco so effectually deadens and destroys vital excitability and the inherent contractility of the living tissues that it is not safe even as a drug, and for that reason is seldom employed in medicine,

especially as it has no known antidote. It is poisonous to all animals, man included. Insects and other inferior animals instinctively avoid tobacco as noxious and deadly. It is very useful to kill vermin of all kinds, and, as stated, kills human beings also ; yet cunning man thinks he can circumvent the laws of nature by using it in the various modes of smoking, chewing, and snuffing without injury, but finds in this, as in many other bad ways, to apply an apt vulgarism, that he is only "playing sharp" upon himself ; for in all cases the poisonous action is manifested in greater or less degree. The poisonous effects of tobacco are experienced when introduced into the body in any way, whether taken by the mouth into the stomach, injected into the bowels, applied to the skin, inhaled through the lungs, or absorbed by the nostrils. " Even the external application of the leaves or powder is not without danger, especially when the cuticle is removed." Death has been produced by the application of the expressed juice of the leaves to the skin and by the inhalation of the smoke. To those unaccustomed to it, in small doses, tobacco induces vertigo, faintness, nausea, vomiting, with frequent, low, weak, trembling, intermittent pulse, failure of the action of the heart, and sharp pains in the chest, with stupor and depression more or less intense ; but in larger doses, yet comparatively small quantities, it causes violent retching, vomiting, purging, convulsions, coma, collapse, and death (*vide* United States, National, and other Dispensatories). Sickness and prostration in various degrees of intensity are constantly attendant upon the first efforts to use tobacco in moderate quantities, and almost always in those who do not use or cannot tolerate it at all, and who suffer greatly therefrom when exposed to it even slightly. " Dr. B. W. Richardson says that the spasmodic seizures are sometimes terrible, especially in boys. There is a sensation of imminent death, the heart nearly ceases to beat, and sharp pains shoot through the chest. Examination of inferior animals under such conditions shows that the brain is pale and empty of blood ; the stomach reddened in round spots, so raised and pile-like that they resemble patches of Utrecht velvet. The blood is preternaturally fluid, the lungs are as pale as those of a dead calf, and the heart is feebly trembling ; such is the primary action

of one's first cigar'' (*Scientific American*). Yet, despite all this, it is in common use, but does not fail to exert its poisonous influence according to the quantity taken and degree of susceptibility thereto, though, like some other poisons, the system tolerates and becomes accustomed to it within certain limits; yet it is only a matter of degree, as it always lowers the standard of health and attacks the weakest part of the body. To those accustomed to its use in moderation its poisonous effects are slow and inappreciable, but, though tolerated, not the less active, sure, and destructive, according to the personal peculiarities and predisposition of the consumer. Degeneration, disease, and death are common consequences of an indulgence therein, though not generally recognized as such.

The evils of tobacco are manifold, acting deleteriously on the physical, mental, and moral nature collectively. Tobacco stunts the growth of the body, arrests the development, and perverts the character of the mind; debases the moral nature; diseases the nares, mouth, throat, stomach, digestion, nutrition, liver, bowels, blood, lungs, heart, brain, kidneys, genito-urinary organs, and general system. It causes irritation, soreness, ulceration, and cancer of the lips, tongue, mouth, throat, and vocal chords; it produces disease of the stomach and digestive organs, with derangement of general nutrition and indigestion, malassimilation, inanition, marasmus, and emaciation. Sometimes, however, from the lazy, inert, non-oxidizing state it induces, it allows of the accumulation of fat and obesity. Though injurious at all times, smoking and chewing of tobacco immediately after eating is especially harmful, as it retards instead of promotes digestion and nutrition, tobacco dyspepsia and malnutrition being very common. It causes sickness of the stomach, with nausea and vomiting; torpidity of the liver, biliousness, piles, and bowel complaints, such as spasm, inertia, and relaxation, or colic and constipation alternated with diarrhœa, and cholera morbus, and doubtless also cholera-infantum and cholera-algida, especially as it is one of the most powerful emetic, purgative, relaxing, and collapsing agents known. Tobacco poisons the blood both directly and indirectly, and thereby affects injuriously every particle and part of the body. Besides its narcotic and other dynamic effects, it causes superalkalinity, thinness, and impurity of

that fluid ; shrivels, cremates, or collapses the blood corpuscles more or less dangerously ; deprives them of air or oxygen, and prevents oxygenation necessary to their life function and perfect action for the benefit of the tissues, organs, and system generally. It thus predisposes to or causes undue fluidity and stasis of the blood, with congestions and hemorrhages of the various organs and tissues, as of the nose, lungs, brain, stomach, bowels, kidneys, bladder, or genito-urinary organs and other parts, with hemorrhoids, spitting of blood, apoplexy, malnutrition, consumption, diphtheria, scurvy, or scorbutic and typhoid diseases, rheumatism, gout, lithæmia, uræmia, albuminuria, Bright's disease, and other maladies of a like nature. It irritates the kidneys and bladder, and induces undue secretion, with diuresis and incontinence of urine, and other affections of those organs. Tobacco deadens and vitiates the sensibilities, with perversion or failure of sight, hearing, smell, taste, and sensation or feeling generally. Many persons are unnecessarily suffering with weak, sensitive eyes, amaurosis, or more or less complete blindness, and using glasses, from the ill effects of tobacco. Deafness in various degrees, with buzzing or ringing of the ears, and other anomalies of hearing, is also frequent therefrom, and likewise disorder of the other senses. Tobacco irritates and paralyzes the nervous and muscular systems, producing neuralgia of the face, heart, and other parts, neurasthenia, malaise, enervation, and prostration of various kinds and degrees ; it is a powerful depressant of the nervo-motor organs. It disorders, depresses, and arrests the action of the central organ of circulation—the heart—particularly, causing derangement of divers kinds, as neuralgia, spasm, palpitation, feebleness and fluttering of that organ, and weak, frequent, followed by a very slow, intermittent pulse, with fatty degeneration or other form of impaired nutrition and entire paralysis thereof, “tobacco heart” being insidious and fatal, that kills without much warning. Death therefrom is often abrupt and awful, and sometimes apparently in the fulness of life and health. It is more than probable that tobacco causes, directly or remotely, many of the sudden deaths usually attributed to neuralgia, rheumatism, disease, and paralysis of the heart, when it is really heart failure from tobacco, which is manifested in a minor degree in



the faintness, prostration, and partial collapse on first using it in small quantities ; but though tolerated to a certain extent, it does not cease to act and insidiously sap the very fountain-head of life, as it also does in another way by producing angina-pectoris, involving both the heart and respiratory organs. I have seen repeatedly dangerous depression and collapse from a very slight exposure to the fumes and smoke of tobacco, with heart failure and slow, feeble, faltering, intermittent pulse, losing one beat in every three or four beats, in the extreme very near the stopping-point altogether, and, of course, death, and which would have inevitably proved fatal if the exposure had been much greater, though very moderate, thus causing *Nicotism* of the heart, blood, lungs, brain, and other organs with the general system. As an example of the extent of this evil in the young and strong, the following item from the papers is noteworthy : " Twenty young men competed last week at Westfield, Mass., for a West Point cadetship, and the examining surgeon was compelled to reject ten of them on account of ' tobacco heart,' brought on by cigarette smoking." Upon the respiratory organs and vocal functions tobacco likewise acts very injuriously in causing huskiness, roughness, and suppression or loss of voice, difficulty of speaking and breathing, shortness of breath, congestion of and hemorrhage from the lungs, laryngeal and pulmonary consumption, undue secretion and accumulation of viscid mucus, with rattling and obstruction of breathing, or increases the phlegm and diminishes the power to expel it, with other affections of the air passages and lungs. Tobacco also more or less seriously disorders the brain and mind. It irritates, congests, narcotizes, and depresses the former and deranges the latter, causing headache, vertigo, rush of blood to the head, apoplexy, loss of memory, inability for continuous or concentrated mental effort, self-distrust, melancholy, with disposition to suicide, insanity, dementia, and paralysis. It is particularly dangerous in any form when the powers of life are low or beginning to decline, and especially when the brain or nervous system, heart, respiratory organs, or lungs and kidneys are weak or affected, and much more so when actively diseased. The frequent early break-down is not so much from overwork or anxiety as from tobacco in those exposed to it, as well as

those who use it. But worse still, it debases the moral as well as the mental and physical nature ; perverts the conscience ; induces laziness, selfishness, deceitfulness, cruelty, and sensuality ; stimulates the sexual functions ; excites the passions, and promotes vice, immorality, and licentiousness ; thus distorts the sense of right and equity, weakens and depraves the mind, subverts and deadens the higher faculties, intensifies the lower propensities, demoralizes and animalizes both those who use it and those exposed to its baneful influence, males and females alike. If women only knew the pernicious effect of tobacco upon health, beauty, purity, and morality, with its power of inducing diseases peculiar to the sex as well as otherwise, they would carefully avoid it, and scout its consumers, smokers especially, as their greatest enemies. In moderation it causes that lazy, dreamy, sensuous feeling which tobacco habitués so much delight in, but in excess it produces impotence and paralysis of the genito-urinary organs, as of all other parts of the body. Tobacco thus induces general decrepitude and premature senility of body, fatuity of mind, and depravity of morals ; dims the eyes, impairs the hearing, loosens and destroys the teeth, wrinkles and otherwise mars the beauty of the face, produces a dark, bilious, and dirty hue of skin, and spoils the complexion ; gives an aged cast to the feature, and imparts an apathetic, imbecile, *blasé* expression to the countenance.

Moreover, from the salivation and depression it induces, tobacco creates an artificial thirst and desire for stimulants, and for alcohol particularly, thereby promoting intemperance with all its horrors, tobacco and rum going together as the twin curses of humanity. As it is thus the direct incentive to drinking and drunkenness, and usually first in the order of indulgence, it is necessary to abstain from tobacco as well as alcohol to insure temperance, and to be free from the terrible evils inseparably connected with their use, singly or combined, they being mutual aids and abettors of each other in the woes they inflict upon mankind. With regard to their influence in causing disease and death, in the *Journal of the American Medical Association*, May 28th, 1887, Dr. Thomas F. Rumbold, of St. Louis, declares that he " made a series of observations concerning the causes of sickness and death among men and

women between the ages of 20 and 40 years. I soon found that most of the ailments and deaths of men arose from the *results of excesses* of various kinds, and the *chief* of these was the use of tobacco and stimulants. In the case of women their sickness and death arose from the results of exposure of various kinds, but principally owing to insufficient clothing." As tobacco and "stimulants"—*i.e.*, alcoholic liquors, are so destructive to health and life at the middle and most vigorous period of existence, how much more injurious and deadly must they be at both the earlier and later stages of life, when the vital forces are so much less capable of resisting their poisonous influence! Either separately or associated, the evil effects of these dire agents upon the human organism and race are disastrous in the extreme.

Dr. Willard Parker, of New York, says (*Medical and Surgical Reporter*): "That tobacco is a poison is proved beyond question. It is now many years since my attention was called to the *insidious* but positively destructive effects of tobacco on the human system. I have seen a great deal of its influence upon those who used it, and worked on it or in it. Cigar-makers, snuff-manufacturers, etc., have come under my care in hospitals and private practice; and such persons *never* recover soon and in a healthy manner from any case of *injury* or fever. They are more apt to die in epidemics, and more prone to apoplexy and paralysis; the same is true, also, of all who *chew* or *smoke* much."<sup>a</sup> And, it might have been truthfully added, likewise of those who are exposed to the noxious influence of this pernicious poison in any manner or form.

Thus tobacco degenerates, diseases, deadens, and depraves the physical, mental, and moral nature; stunts the growth and prevents the development and activity of body and mind; causes intellectual aberrations, insanity, and imbecility, with perversion of conscience and deviations from rectitude; blunts the finer sensibilities and intensifies the lower propensities; provokes tipping and intemperance; degrades, hardens, and brutalizes the disposition; debases the order of humanity to that of animality, and incites to beastly indulgence in the most vicious and immoral courses, which lead to destruction and death, with ruin of body and soul.

I have thus briefly glanced at a few of the prominent evils of tobacco, but there is another phase of the subject not generally thought of which requires the profoundest consideration, and that is its effects upon others than its consumers, and their right to inflict this pernicious poison upon other people, or conversely.

#### THE RIGHT TO BE FREE FROM THE POISONOUS TOBACCO.

It is a fundamental principle of equity and justice that no one has a right to injure another for his own pleasure or profit, and yet smokers and vendors of tobacco assume the right to do this very thing, and are permitted to discommode and injure others almost at pleasure. Because they can bear this potent poison to a certain extent without appreciable toxic effect, though all of the effects of tobacco are poisonous in degree, they assume that others can and *must* endure it also, whereas there is a large class of delicate, sensitive, and sickly persons—men, women, and children—who are more or less seriously affected by it, and who can neither use, get accustomed to, nor tolerate it in any degree, many struggling for breath and life to whom it is especially injurious in varying degrees of dangerous poisoning, according to susceptibility and power of resistance thereto, and whom it is cruel and criminal to afflict therewith, which smokers so recklessly do. Even the infliction of discomfort is objectionable and wrong, and much more outrageous is enforced sickness, suffering, and danger to life therefrom. Consumers of tobacco themselves even cannot bear it when sick, and much less those who cannot get accustomed to or tolerate it at all at any time. Besides, because some choose to debase, disease, and kill themselves with tobacco, it does not follow that even others who can get accustomed to it, yet wish to be free from its noxious influence, *must be forced* to do so, too, and much more those who cannot bear it at all, and be thereby reduced to their degraded level and sunk in the scale of humanity or destroyed for the vicious indulgence of smokers. Is there any more reason, right, justice, or humanity in and necessity for this than for forced consumption of chloroform, opium, or other poison? Not in the least; it is grossly tyrannical and outrageous to compel any one to inhale the fumes or smoke of tobacco



or to take it in any other way, and suffer discomfort, pain, sickness, disability, and, perchance, death therefrom. It is lamentable to note the number of public and other men who have killed and are killing themselves with tobacco, poisoning, afflicting, and destroying others therewith at the same time. Its votaries must be allowed to narcotize, deaden, debase, disease, poison, and kill themselves with tobacco if they will, but to afflict, disable, torture, and destroy other people slowly or suddenly by sickness, suffering, gradual degeneration, or speedy death, and thereby commit outrage and homicide, as well as self-injury and suicide, therewith, should not be permitted. Even when not smoking their clothing and persons are so saturated with the fumes of tobacco that poisonous emanations therefrom are a source of disease to others. I have known headache, vertigo, sickness of stomach, huskiness of voice, shortness of breath, difficulty of breathing and speaking, tic douloureux, neuralgia, spasm, and weakness of the heart, feeble, frequent, and intermittent pulse, faintness, and other ills, to be induced by the noxious exhalations from the persons of tobacco-smokers, so that they are doubly a veritable walking pestilence, and should be shunned by every one having any regard for their health of body and mind. These offensive tobacco-saturated people are obnoxious even to smokers themselves. I was told by a prominent dentist of this city, himself a smoker after business hours, that he refused to operate for a wealthy patient because of his offensiveness with tobacco that he could not endure him. How much more noxious and sickening it is to those who cannot bear it at all !

It is a rule of life that if a person or thing offends you, to go and keep away from them ; but while you may measurably avoid tobacco-chewers, who are offensive enough with their foul breath and disgusting sputa, you cannot readily keep away from the smoking boors with their poisonous tobacco smoke, for they intrude upon you almost everywhere, and the smoke diffuses itself and penetrates wherever air will go, even through ceilings and brick walls when confined, and perchance reach some unhappy sufferer, causing headache, neuralgia, difficulty of breathing, palpitation of heart, irregularity and enfeeblement of pulse, nausea, with the strong characteristic odor, and other evidences of the presence of and poisoning

from tobacco, as I have known it to do repeatedly. Therefore, smoking-rooms are a delusion and a snare, as you cannot easily confine tobacco smoke to any one place. Thus, beside the open production of and exposure to tobacco smoke, it may reach and afflict susceptible people in devious ways. I have also known a mere whiff of tobacco smoke to produce headache, with neuralgia of the face and other ills, and entail prolonged suffering, requiring medicine for relief, all of which suffering and drugging was unnecessary, and for the mere pleasure of smokers. How little do smokers appreciate or care for the amount of suffering they occasion by their vicious habit and criminal disregard for the health and rights of others, which they should be obliged to respect by law! I have under my care a gentleman who is a perfect martyr to this tobacco poison. He is an enforced invalid therefrom; after much sickness and suffering he had to succumb to it, broken up in health and business, and reduced to privation and dependence, when he could otherwise be well and independent, as his health recovers when free from the tobacco poison, and he could supply himself with the comforts and luxuries of life. The patient is proud and sensitive, and beside the enforced sickness, suffering, and idleness therefrom, is deeply humiliated at the false position he is thus obliged to assume; deprived of health and comfort, debarred from business and all the common enjoyments of life, and compelled to live the life of a recluse, his only hope is to get a little place where he could make a living away from these smoking barbarians who belch forth volumes of this noxious smoke—the pall of disease and death—and diffuse the fumes of this potent tobacco poison without regard to the health or rights of other people, for which they should be severely punished. Smoker, imagine yourself in his place of enforced invalidism, sick and suffering in body and mind, with all life's hopes blasted, struggling for breath, and *gradually strangling to death*—for before he fully recovers from one he gets another dose of the poisonous fumes or smoke of tobacco despite his utmost care—and many like him in some degree, by this barbarous custom of tobacco smoking of which you are guilty, and then, perhaps, you may see yourself as others see you—as an outlaw trampling upon the rights of and inflicting cruelty upon your fellow-

beings. Think of the harm and wrong you thus do to many delicate, sensitive, sickly, susceptible, and defenceless men, women, and children ; to family of wife and little ones, sons and daughters, if you have any, with relatives, friends, associates, and casual meets, in causing discomfort, sickness, disease, demoralization, and sometimes death, directly or indirectly, when least suspected. If you care not for yourself, by generating and diffusing the fumes of this pernicious tobacco poison, and if you have any conscience, feeling, or disposition to do as you would wish to be done by, you will give up the baneful habit of tobacco smoking, which cannot benefit, and will more or less seriously injure you and others more impressible to its poisonous effects, especially as it is opposed to all the rules of health, refinement, propriety, equity, justice, manliness, morality, humanity, and Christianity to adopt or continue this vile practice and smoking barbarism of the age.

How is it possible to retain, much more to regain, health while breathing the poisonous fumes or smoke of tobacco, which attacks the vital energies of the very basis of life, the organization of cells, blood, heart, nutritive and nervous systems? What folly and farce it is to prate about the value of ventilation and pure air when violating the first principles of hygiene and sanitation by generating and diffusing this pernicious tobacco miasm, thus polluting and poisoning the air with the noxious fumes of tobacco, and leaving nothing to breathe but this baneful tobacco malaria, which enters and fills the blood and bodies of those exposed to it with one of the most penetrating and pestiferous miasmata known. Even the unborn are deleteriously affected by it, as it often destroys them and causes their premature birth, being a powerful abortifacient. When not immediately destructive of life, besides the hereditary predisposition to deformity and disease therefrom, it is apt to warp or dwarf body, mind, or moral nature in some respect, and so much the more if exposed to its pernicious influence in infancy. If they survive, what kind of children can be expected formed from bodies saturated with tobacco, or nicotized germs of nicotized parents and nicotized blood, reared on nicotized milk and breathing nicotized air? Those not thus destroyed entirely must neces-

sarily be degenerate beings, and robbed of the greatest of all blessings, a healthy organization, physically, mentally, and morally, and correspondingly handicapped in the race of life by this potent tobacco poison inflicted upon them by parents and others, and still further distorted and injured, if not killed at some period in early life, if they are continuously exposed thereto, by forcing them to inhale the noxious smoke of tobacco, so liberally diffused everywhere, even in houses. Besides its direct poisonous effects, there is very little doubt but that infantile as well as adult mortality is largely increased by tobacco acting as a predisposing and exciting cause of the diseases of children. Thus of the blood, air passages, respiratory and digestive organs, gastro-intestinal canal, kidneys, nutritive and nervous systems, and brain particularly, with spasm of the glottis, spells of choking and gasping for breath, strangulation, asphyxia or privation of air, scorbutus, sore mouth or throat, quinsy, diphtheria, typhoid, malignant and putrescent diseases,\* indigestion and malnutrition, sickness of stomach, vomiting, biliousness, bowel complaints, purging or cholera-infantum, excessive secretion and incontinence of urine, pining or wasting away, inanition, marasmus, consumption, debility, depression with spells of sinking, meningitis, convulsions, and other affections, with slow or speedy death, though suffering and dying in these divers modes, according to impressibility, yet really poisoned and killed with tobacco, to the pestiferous fumes of which they are so freely exposed, for without it such disorders would not be so severe or occur so frequently and fatally, and in many cases not at all. The "slaughter of the innocents" in tenement-houses and other close places especially is no doubt largely due to the poisonous action of tobacco, the miasmatic smoke of which abounds so profusely in such places by the frequent smoking therein. Even when not thus killed outright prematurely by tobacco it entails physical, mental, and moral suffering and degradation for a time or the balance of life often worse than death. The peculiarities of the parents are intensified in the children, and the habits of the former, both by descent and example,

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\* *Vide* "Basic Pathology and Specific Treatment of Diphtheria, Typhoid, Septic, and Allied Diseases," by the author.



become fixed in the latter. Thus with regard to the use of tobacco in early life, the hereditary tendency, example, and forced inhalation of its noxious fumes by frequent exposure thereto accustom children to it, so that they become habituated and addicted to it as a matter of course. To save the young most effectually from this baneful practice, the elders must reform and discontinue the use of tobacco themselves, and not expect youth to fight against hereditary tendency, example, and habit altogether or separately, which is often too strong to easily resist, even when convinced of the evil effects of the "vile weed." Therefore, let the influence be against rather than in favor of its use by the elders; total abstinence from tobacco as well as alcohol is the rule of safety with all, both seniors and juniors, as the use of one leads to the other, and separately or combined they are fearfully demoralizing and destructive to health and life.

But, further, the evil of tobacco smoking and malaria extends indefinitely. Even at places and on excursions for the sick, and at health resorts for valetudinarians, which ought to be free from every form of miasm, this baneful practice and malaria abound, especially at the last, so that it is a delusion and a snare, and often worse than useless for invalids to waste time and money to go there in the vain hope of regaining health, when at almost every breath indoors and outdoors they are obliged to inhale this pestiferous tobacco malaria, for the air is contaminated almost everywhere with the poisonous fumes of tobacco, thus converting sanatoria into smoking places and veritable disease and death traps, to the sick especially, without pure and with poisoned air that is actively inimical to health and strength, which, instead of favoring recovery, still further increases the tendency to disease and death. The best climate in the world will be of no avail with this pernicious tobacco malaria predominant, or the use of the "vile weed" in any form. Therefore, tobacco smoking should be prohibited under heavy penalties, and entirely abolished at health resorts as a necessity for salubrity, the promotion and recovery of health, and the preservation of their sanitary reputation; otherwise, such places will be shunned by all who wish to be well or recover from sickness; by invalids particularly seeking pure air free from all forms of malaria, of

which the artificially engendered tobacco smoke is the worst, as it not only diseases the physical, but debases the mental and moral nature altogether. A strong reaction has set in against this nuisance and plague of morbid tobacco malaria and these pseudo-health resorts, which are sanatoria only in name, lacking, with all other places where it prevails, the most essential prerequisite of all *pure, unadulterated air* for life and health. Thus all ages and both sexes, men, women, children, and invalids especially, who are least able to resist or escape from its baneful influence, are afflicted by this pernicious tobacco poison, as they are more confined to the tobacco miasmatic atmosphere of houses and elsewhere, which smokers so freely contaminate therewith in utter disregard of the health and rights of others to be free from this with every other poison.

In true equity and justice it is as much a crime to sicken, disease, torture, disable, debase, or poison and injure others in any way, collectively, with the fumes or smoke of tobacco, as with its most active principle, nicotia, or any other constituent or form of the noxious poison. The sickness, suffering, and disability is the same, and the punishment ought to be the same, or commensurate with the crime. If one injures another in any other way there is a legal claim for damages or redress, but from the fumes or smoke of tobacco it is treated as a lenient offence, unless at common law in case of wilful annoyance and injury, for there are some fiendish enough to torture others therewith when aware of the undue susceptibility to tobacco. Smokers have no more right to pollute or poison the air we breathe with the fumes of tobacco than with those of chloroform or any other poison, or than the water we drink or the food we eat with it any more than with other poisons. One offence is as heinous as the other—in fact, more so, as the air must be constantly inhaled *nolens volens*, and cannot be rejected like the others, and no one should be permitted to engender a pestiferous miasm or poisonous malaria and diffuse it indiscriminately in tobacco smoke than in any other form. They would not dare to thrust solid, powdered, or liquefied tobacco into the mouth and nostrils of others, yet they compel them to inhale the poisonous vapor or smoke of tobacco whether they will or no, which passes

directly into the blood and poisons the whole system, affecting the entire being, body, mind, and moral nature, to the more or less serious debasement of all. Hence, in view of these facts, the burning or smoking of tobacco should be absolutely prohibited in all public places at least, and smokers should be compelled to keep the tobacco poison to themselves and those who wish it, like the Chinese with their opium, and not diffuse it to the detriment of those who wish to be free from its pernicious effects. They have no more right to sicken, disable, or injure others, or endanger health and life in any way with tobacco than with arsenic, opium, chloroform, the bullet, bludgeon, or other thing ; one is as criminal as the other, and they should not be allowed to outrage people with the one any more than with the others. We inveigh against the barbarism of *secret* opium smoking, which poisons only the offender, yet we fail to see the greater barbarism of *open* or public tobacco smoking, which injures not only the transgressor, but poisons all within the range of its pernicious influence, the innocent with the guilty, most seriously. Still, we consider the latter "civilized ;" but is not this term more applicable to the former, or cannot it be justly applied to either? and is not the epithet "heathen," used to designate the former, more appropriate to the tobacco than the opium smokers, especially as they inflict sickness, suffering, and debasement upon innocent and susceptible persons—men, women, and children—without stint or regard for right, justice, or humanity?

" Oh ! wad some power the giftie gie us,  
To see oursels as ithers see us."

To allow one individual or class of persons, by the use of this potent tobacco poison in any degree, to change the disposition or character, debase the physical, mental, and moral nature and conditions of people, and inflict discomfort, sickness, suffering, invalidism, and, perchance, death, directly or indirectly, upon them, is unjust, outrageous, and barbarous in the extreme, and contrary to sound public policy. No claim of any kind whatever to smoke or use tobacco can justify such an outrage upon the people. Nor can the use of tobacco be defended upon the cold-blooded principle of "the survival of



the fittest," from a more physical standpoint, as it would sacrifice the industrious, delicate, sensitive, intelligent, refined, moral, and sickly for the strong, lazy, ignorant, selfish, sensual, cruel, and vicious, or the better elements of society for the worse, though largely it is rather "the extinction of the unfit," as it has been shown that the consumers are inferior to the abstainers from tobacco, physically, mentally, and morally. Even the same person at different times consuming or abstaining therefrom exhibits a marked superiority in bodily, mental, and moral power when free from tobacco. From the great increase of lunatics and paralytics in the hospitals of France—five times in proportion to population to thirty years before—and the corresponding increase of revenue from the monopoly of tobacco, Napoleon III. was induced to appoint a commission of scientists to ascertain whether this was cause and effect or mere coincidence. After careful investigation, in which the students of schools and colleges were divided into consumers and non-consumers of tobacco, the abstainers were found to be so far superior—physically, mentally, and morally—that by edict the Emperor prohibited the use of tobacco in these State institutions of learning in France, whereby "thirty thousand persons were at once forced to abandon it" (Dr. Willard Parker). The same experience in this country led to the prohibition of tobacco in our national academies of West Point and Annapolis, with some other educational institutions. The rest must follow suit for the good of their students and the reputation of their schools, or lose caste and lag behind; for they may rest assured that considerate parents and guardians will not send children or wards, and live students will not go to such institutions, where they must either acquire the vile habit of using or be exposed to the pernicious fumes of tobacco, which will, in spite of themselves, narcotize their brains, becloud their minds, deaden their faculties, and handicap them so as to render their studies harder, more arduous, and less profitable than they would otherwise be, thus putting an additional and unnecessary strain upon them, which must eventuate in impaired or ill-health of mind or body, or both, to say nothing of the demoralization and vicious tendencies engendered thereby. Thus tobacco stupefies, blunts, and weakens the understanding,



memory, judgment, and reason, with other faculties, and renders studies or mental effort of any kind, which would otherwise be easy and pleasant, a task, irksome, toilsome, inefficient, and injurious, while it enervates the nervous, muscular, and general system, excites the animal nature, and depraves the disposition, and even incapacitates for excelling in athletic exercises, business, and other purposes requiring active exertion of body or mind.

The use of this potent tobacco poison is thus opposed to the elevation, nobility, and civilization of mankind, as its narcotizing and depressing effects make people lazy or indifferent to exercise of body and mind, thus encouraging ignorance, idleness, poverty, and pauperism, with the artificial thirst and sensuality it engenders; promotes intemperance, immorality, licentiousness, and degradation of all kinds also. The indolent, ignorant, drunken, depraved, vile, vicious, and imbruted are almost universally addicted to it, and therewith sink themselves and others into torpor, stupor, and imbecility, to the lowest plane of animal existence. Some become so habituated to tobacco that they are never content without its narcotizing or nicotizing influence, as if they were afraid their faculties would be too lively and active without its stupefying and depressing effects, and they must put a damper upon to deaden them, instead of letting them be free to work more easily and untrammelled. But at the same time smokers also stupefy, dampen, and deaden the faculties of other people exposed to it, and, still worse, disease their bodies, debase their moral nature, excite vicious appetites, and create in them as well as themselves an artificial thirst for alcohol, with many other ills, and even destroy life itself, in defiance of every principle of sanitation, humanity, and justice—an outrage which should be punishable as a crime of the deepest dye. Thus, from and before the inception of life in the hereditary tendencies of the unformed and unborn babe to the most aged, all ages, and both sexes, sick or well, innocent or guilty, is this baneful tobacco poison active in spreading degeneration, disease, debasement, desolation and ruin of body, mind, and morals, and blighting health, strength, mentality, morality, and the highest aims and hopes, with life itself, of mankind.

For the suppression and eradication of this dire evil, there-

fore, let every one abstain from tobacco in all its forms, and to further this desirable end, organize anti-tobacco societies everywhere of abstinence therefrom, to enforce precept by example, and render its use filthy, vulgar, detestable, unmanly, indecent, vile, and altogether inhuman and illegal ; by having laws passed prohibiting its use, by smoking especially, and to prosecute all who offend in burning or smoking tobacco, or accessory thereto, against the health and rights of the people, particularly such mercenary railways as lure and entrap passengers in cars, and then allow some to enter with a lighted cigar, cigarette, or pipe to burn or smoke tobacco, thus sickening and poisoning them, causing frequently nausea, headache, neuralgia, and sometimes more serious illness, especially in delicate, sensitive, sickly persons and invalids out for an airing, or travelling for health or otherwise, for which both the transgressors and company are in equity liable for damages for injury in this as in any other way. Besides, the former is otherwise punishable for criminality in poisoning with the fumes as with solid or any other form of tobacco or poison. In this most impressive manner to teach these cruel offenders against the health, comfort, and lives of the people that others have rights they *must respect*, to be free from this tobacco as every other poison or injury whatever. As the world becomes enlightened upon this all-important subject the consumers of tobacco, and smokers especially, will be tabooed, put under the ban of the law, and driven from society as enemies to health, purity, sobriety, industry, decency, propriety, equity, justice, mentality, morality, religion, and all that is good and noble in humanity.

Impressed with the deleterious properties and effects of tobacco, as well as alcohol, which is a matter of faith, the Sultan of Morocco has prohibited its use by his people, and ought to have a testimonial therefor, as suggested by the *Philadelphia Ledger*. "He not only insists on the strict enforcement of the Moslem rule against intoxicating drinks, but extends the order to tobacco and snuff-taking as intoxicants also. Tobacco is the unclean thing as well as strong drink among the faithful at Tangier and elsewhere in his dominions. His prohibitory edicts are read in all the mosques." He thus proves himself to be the most enlightened ruler in the

world, as he strikes at the root of the evil, and sets a good example to the so-called yet far from civilized governments which not only tolerate, but encourage their use ; for so long as the two such terrible blots as tobacco and alcohol, or either of them, remain upon the national escutcheon—the emblem and types of barbarism—so long they must be classed with uncivilized or even heathen nations, as they bear with them such a flood of barbaric habits and customs as to threaten to engulf the people, they being the basic evils from which most others flow that afflict them so sorely, and the removal of which would allow a great tide of good to flow in upon society. Would that some general despotic power could sweep them from the earth ! But generally the people must free themselves from these twin curses of mankind.

In relation to individual and national degeneration from tobacco, the *Scientific American* says, in concluding an article on “ A Cigar Scientifically Dissected : ” “ What is the end of it all ? Effects on individuals likewise affect communities ; these in turn influence the nation. No person that smokes can be in perfect health, and an imperfect organism cannot reproduce a perfect one. Therefore it is logical to conclude that, were smoking the practice of every individual of a nation, then that people would degenerate into a physically inferior race. It would follow, moreover, that in those countries where smoking is most practised, a lower physical, and consequently lower intellectual, development must be found. Such, we think, will be conceded to be true of Spain, of Cuba, of Portugal, of Turkey, of Greece, and of the South American countries, where those who are addicted to the habit vastly outnumber those who do not smoke.” Also of India and of Eastern countries generally.

Thus, in every land and in every clime where the use of tobacco prevails it causes degeneration, degradation, debasement—physical, mental, and moral—disease and death, or individual and national decadence, so that, to parody Goldsmith, it may be truly said :

Ill fares that land to nicotian miasm a prey,  
Where tobacco blights and human beings decay.

OUR NATIONAL PHYSIQUE.

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SOCIAL economists have had for some time past a very interesting and important problem submitted to them which they have found difficult to answer—namely, whether our population is improving or degenerating in health and physique. For a long while we were content to count heads and to believe that so long as the census returns showed a good increase, the nation was progressing and all was going well with it. Lately, however, these ever-increasing heads have been found to possess hungry mouths, and our attention has been directed to devising schemes for emigrating adults, and providing penny dinners for school children to satisfy their outcry. The question of the improvement or degeneracy of the people is a very serious one. The Factory Acts have been in operation more than fifty years, the Education Acts for nearly twenty, and during the last quarter of a century the Sanitary Acts have led to borrowing and expenditure of many millions of money on drainage, water-supply, open spaces, and other sanitary works, and it would be very grievous if no benefit has resulted from them. On this, as on so many other subjects, the doctors differ; but not without reason in this case, as the proper data for forming a sound judgment are mostly wanting. The Registrar-General, it is true, assures us that the length of life has been increased all along the line, and not only are more infants' lives saved, but persons of the bread-winning ages live longer than formerly. But this evidence does not satisfy some people, who think that we are merely preserving by our improved medical and sanitary knowledge a larger number of diseased or delicate individuals, who lower the general standard of the national health, instead of raising it to a higher level, as is asserted by their opponents.

We have ample data of the physical condition of all classes of our population of the present day, but we have no data of a similar kind relating to a former period with which to compare it, except a few observations on factory children made in 1833. Compared with these the factory children of the pres-



ent day are a whole year in advance in physical development, and it might be inferred that equal progress had been made in other classes. In his address at the Co-operative Congress, Mr. Holyoke stated that "in a few years after the repeal of the Corn Laws every million of adult persons in England weighed twelve thousand tons heavier than they did before the repeal, and the young people had grown ten times more comely than they were before;" but he did not state how he had arrived at his results, and we know of no statistics from which they could be obtained.

In the absence of direct evidence we may fall back on the records of the recruiting department of the army, as Director-General Sir Thomas Crawford did in his address at the British Medical Association at Dublin last week. But statistics of this kind must be received with great caution, as there have been many disturbing elements at work during the twenty-five years to which they refer. The standard has been lowered, thus admitting a lower social class, and the recruiting ground has changed from the country districts to the large towns. Moreover, the condition of the labor market and the variable demands of the army for recruits must disturb the even tenor of recruiting, and if we may safely accept the skilled medical examinations as a pretty constant quantity, we cannot accept that of the recruiting sergeant's with equal confidence, and it must therefore be eliminated. Dr. Crawford takes a desponding view of the subject, which we think is not warranted by the statistics he places before us. "It is by no means unusual in these latter days," he says, "to hear the champions of sanitary science boast, and justly boast of the perceptible prolongation of life which has been secured to the race through the beneficial effects of improved sanitary arrangements. . . . But, while admitting all the good thus done, there is evidence of perceptible deterioration or degeneration of type in the lower order of the people." Sir Thomas arrives at this conclusion by the simple process of adding up the total number of rejections of recruits for all causes for the years 1860-64 and 1882-86, and comparing them together. He finds that the rejections for the earlier period were 371.67 per thousand, and for the latter period 415.58 per thousand, a difference of 43.91 in favor of the recruits of twenty-five years ago.

\* The question is one of such grave social and political importance that we have felt constrained to examine Dr. Crawford's tables more critically than he has done, and with the result of arriving at the opposite conclusion to that at which he has arrived, thus showing the truth of the adage that statistics may be made to prove anything. If we eliminate the errors of the recruiting sergeants, who seem to have been much more zealous and less judicious in the preliminary selection of recruits in the latter than in the former period (and they might have found ten times as many more below the regulation standard without proving the physical inferiority of the class from which they gathered them), the number of rejections by the examining surgeons is reversed for the two periods selected for comparison; the numbers for 1860-64 being 301.30, and for 1882-84, 206.41 per thousand—a difference of 94.89 in favor of the present time. If we examine the cause of rejection in detail the result is still more strikingly in favor of the present time. Thus, on comparing the earlier with the later period, we find that the rejections for physical defects of the body (varicose veins, ruptures, accidental deformities of limbs, etc.) have fallen from 139.12 to 79.63; diseases of the skin and ulcers, from 17.30 to 7.26; diseases of the mouth, teeth, nose, and ears, from 18.93 to 13.31; impaired constitution and general diseases, from 27.28 to 10.73; tubercular diseases (scrofula and phthisis), from 14.80 to 5.75—a most remarkable difference, seeing the comparison is chiefly between country and town recruits; syphilis, etc., from 17.66 to 11.55—equally remarkable from a moral point of view; and diseases of the lungs not of a consumptive character, from 2.82 to 1.75—the total number of rejections under these heads being 237.91 for 1860-64, and 129.98 for 1882-86—a difference of 107.93 per thousand in favor of the present time. On the other hand, the present rejections exceed those of twenty-five years ago in congenital malformations by 10.24 to 7.36; in nervous diseases and weak intellect by 3.72 to 2.06; in heart disease by 19.52 to 17.21; and in diseases of the eyes and defects of vision by 41.92 to 36.22; the totals bearing the relation of 75.40 for 1882-86, and 62.85 for 1860-64. The appearance of more malformations in the later period is probably due to the errors of recruiting sergeants; while the in-

crease in the rejections for heart disease and defects of vision are largely due to the greater skill in diagnosis of our modern army surgeons, and by the greater demand for good sight by the improvements in the range of firearms. This surmise is borne out by the fact that defects of vision do not appear under a separate heading in the tables for 1860-64, but are combined with the diseases of the eyes and eyelids. Short-sight, which is a cause of a large number of rejections, is more common in town than country folk, for the simple reason that townspeople have less need for long-sight, they have fewer opportunities for exercising their sight on distant objects, and their occupations favor its development by training or selection ; but it is not, in the majority of cases, a proof of physical degeneracy, as we see among the Germans, who are a notoriously short-sighted people.

If it is borne in mind what we have already stated, that the recruiting-ground has been changed from the country to the town populations, and also how great is the competition for men of good physique by railways, police, etc., we have good reason to be satisfied with the evidence of physical improvement in the class of our population from which the recruits of the army are now drawn—and by inference of the material of the army itself—as evinced by the statistics laid before us by Sir Thomas Crawford.—*The Saturday Review*.

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A NEW USE FOR THE TOBACCO PLANT has been discovered in England. Its stems and waste, it is claimed, are equal to linen rags in the manufacture of paper. In that country tobacco waste costs less than ten dollars a ton, while linen rags are quoted at fifty-five dollars. There is no expense in assorting the former, and very little shrinkage, as against a loss of one third of rags. The yearly tobacco waste is estimated by the census report of England at from three million to four million pounds. We cannot give the figures for the waste in this country, but compared with the above they must be immense, and the discovery of this new use for the refuse of the tobacco plant is of the greatest importance to us, as we manufacture a very large proportion of the paper supply of the world.—*Indian Agriculturist*.



## MEDICAL AND SANITARY SERVICE ON BOARD IMMIGRANT PASSENGER VESSELS.

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THE following report, appropriate to the time of needful Congressional action, was made to the American Medical Association at its meeting in Chicago, June 7th, 1887.

The portions of the law to which particular attention was invited, because frequently evaded, read as follows :

“ That it shall not be lawful for the master of a steamship or other vessel whereon emigrant passengers, or passengers other than cabin passengers, have been taken at any port or place in a foreign country or dominion (ports and places in foreign territory contiguous to the United States excepted) to bring such vessel and passengers to any port or place in the United States unless the compartments, spaces, and accommodations hereinafter mentioned have been provided, allotted, maintained, and used for and by such passengers during the entire voyage ; that is to say, in a steamship, the compartments or spaces, unobstructed by cargo, stores, or goods, shall be of sufficient dimensions to allow for each and every passenger carried or brought therein one hundred cubic feet, if the compartment or space is located on the main deck or on the first deck next below the main deck of the vessel, and one hundred and twenty cubic feet for each passenger carried or brought therein if the compartment or space is located on the second deck below the main deck of the vessel ; and it shall not be lawful to carry or bring passengers on any deck other than the decks above mentioned. And in sailing-vessels such passengers shall be carried or brought only on the deck (not being an orlop deck) that is next below the main deck of the vessel, or in a poop or deck-house constructed on the main deck ; and the compartment or space, unobstructed by cargo, store, or goods, shall be of sufficient dimension to allow one hundred and ten cubic feet for each and every passenger brought therein. And such passengers shall not be carried or brought in any between-decks, nor in any compartment, space, poop, or deck-house, the height of which from deck to deck is less than six feet.” . . .

“ That in every such steamship or other vessel there shall be promptly built and secured, or divided off from other spaces, two compartments or space to be used exclusively as hospitals for such passengers, one for men and the other for women. The hospital shall be located in a space not below



the deck next below the main deck of the vessel. The hospital spaces shall in no case be less than in the proportion of eighteen clear superficial feet for every fifty such passengers who are carried or brought on the vessel, and such hospital shall be supplied with proper beds, bedding, and utensils, and be kept so supplied throughout the voyage. And every steamship or other vessel carrying or bringing emigrant passengers, or passengers other than cabin passengers, exceeding fifty in number, shall carry a duly qualified and competent surgeon or medical practitioner, who shall be rated as such in the ship's articles, and who shall be provided with surgical instruments, medical comforts, and medicines proper and necessary for diseases and accidents incident to sea-voyages, and for the proper medical treatment of such passengers during the voyage, and with such articles of food and nourishment as may be proper and necessary for preserving the health of infants and young children ; and the services of such surgeon or medical practitioner shall be promptly given, in any case of sickness or disease, to any of the passengers, or to any infant or young child of any such passengers, who may need his services. For a violation of either of the provisions of this section, the master of the vessel shall be liable to a penalty not exceeding two hundred and fifty dollars." (Act of July 22d, 1882.)

Your Committee regrets that, notwithstanding the delay of its report (which would have been submitted last year but for the unaccountable failure of the mail delivery to the meeting at St. Louis), the purpose for which it was appointed is still unattained. After conference and considerable correspondence with the House Committee on Commerce, your Committee was given to understand that the "Act to Regulate the Carriage of Passengers by Sea," of July 22d, 1882, already provided against the evils of which it complained. To that reply the Chairman of your Committee addressed a letter, January 21st, 1886, to the Hon. John H. Reagan, Chairman of the House Committee on Commerce (and author of the "Act to Regulate the Carriage of Passengers by Sea" as it now obtains), calling his attention to the manner in which the obligations of the law are evaded, and requesting that it be amended accordingly ; comprehending such suggestions for amendment as had been agreed upon by your Committee.

The chief evasions of, and abuses under the law are, firstly, wherever the law reads "whereon emigrant passengers, or

passengers other than cabin passengers," *first* cabin and *saloon* passengers are construed into exemption from the legal obligation ; and secondly, in the incompetency, insufficiency, and disgraceful status of the medical officers.

To meet these evasions and wanting conditions, your Committee recommended and still urges that the law be amended as follows :

1. Wherever the words "cabin passengers" occur, they should be made to read *first* cabin and *saloon* passengers.

2. That Section 5, of the Act of July 22d, 1882, which requires that "Every steamship or other vessel carrying or bringing emigrant passengers or passengers other than cabin passengers, exceeding fifty in number, shall carry a duly qualified and competent surgeon or medical practitioner," besides the amendment of the words cabin passengers, be further amended, after the first occurrence of the word "practitioner," to read as follows :

And where the number of such passengers and crew is over six hundred, a junior or assistant surgeon or medical practitioner in addition shall be appointed. And the services of such surgeons or medical practitioners shall be promptly given without fee in every case of sickness, disease, or accident originating on board and incident to the voyage, to any of the passengers or crew, or to any infant or young child of any such passenger who may require their services ; and the medical officer, where there is but one, and the senior where there are two, shall also be required to perform the duties of sanitary officers ; to make daily inspections of all inhabitable portions of the vessel, and daily reports in writing thereon to the master of the steamship or passenger vessel, together with such suggestions and recommendations as in his judgment may be necessary to the preservation of health on board. He shall also exercise constant vigilance in regard to the condition of the provisions and water, and promptly report to the master anything which may appear to him to be deleterious to the health of any person on board. And for the prompt exercise of these functions and the maintenance of the respect to which such medical and sanitary officers are entitled, they shall be provided with a steward or apothecary competent to dispense medicine under their direction and for their special

service ; and their tenure of office, remuneration, and right to quarters, subsistence, and attendance shall be upon the same basis as, and co-ordinate with the purser of the vessel on which they serve.

For a violation of these provisions, or either of them, or the disregard of the recommendations made in writing by the medical and sanitary officers as herein provided, the company to which the steamship or other passenger vessel belongs shall be liable to a penalty not exceeding two hundred and fifty dollars in every case. Moreover, it shall be the duty of the sanitary and medical officers of every steamship or other vessel carrying or bringing passengers to the United States, to report in writing under oath, to the health officer of the port at the port of arrival, in detail, every case of illness or accident, with the nature and the result thereof, and every case of imbecility or insanity which may have fallen under his observation, and upon all the conditions herein provided for the protection and preservation of the health of all persons on board, and for the protection of the United States against the immigration of persons excluded by Section 2 of the " Act to Regulate Immigration " of August 3d, 1882.

Your Committee feels constrained to urge that, notwithstanding the apparent conclusion of the House Committee on Commerce that the laws governing immigration are already sufficient, the exceptions to which your attention is invited are of such importance as to call for additional Congressional action, not only for the evils incident to an increasing immigration, overcrowding and excessive mortality from ordinary diseases on board ship, but also on account of the increased danger of introducing epidemic disease by reason of the incompetent medical service and the want of proper sanitary care.

The average duration of the time of emigrants on board ship to the time of their discharge at Castle Garden, New York, is about ten days. Common observation and some familiarity with the salutary effects of a sea voyage on such persons, justify the opinion that there should be an improvement in their health and a decrease in their ordinary rate of mortality ; yet, by the most recent summary at the disposal of your Committee, of 27,157 emigrants who took passage to

New York during the month of April last, 41 died on the voyage—an annual rate of over 55 per 1000 ; more than twice as large as the average death-rate of the populations at the ports of departure, and larger than that of any similar number of persons, in the absence of an epidemic, of which your Committee has any knowledge. The death-rate of Cairo, in 1885, was 48.5 ; of Alexandria, 51.4. But the mortality of both those places is exceeded by the deadly artificial climate of this class of passenger vessels, and the criminal negligence of those who transport emigrants to the United States !

Your Committee has not felt itself called upon to enlarge its investigation into the extent of the failure of that portion of the law which is intended to prohibit the immigration of convicts, lunatics, idiots, and other persons liable to become a public charge. It will suffice to state that all persons familiar with the statistics of institutions for the care of such persons in the United States, are abundantly conversant with the magnitude of the evil. But it has been our effort to meet it by securing such amendments to the laws as we have recommended.

With the hope that the effort of the Association may be more successful, if it be your pleasure to accept this report as final, and to adopt it as its sense of the issue, your Committee offers the following resolution :

*Resolved*, That the Secretary of the Association be and is hereby directed to transmit copies of this report to the Hon. Secretary of the Treasury of the United States and to both the Senate and House Committees on Commerce, and in behalf of the American Medical Association we urge upon them such action, through Congress or otherwise, as will secure better protection to the health and lives of emigrants, and the United States against the immigration of dependent persons.

A. N. BELL, M.D., Chairman,

I. N. QUIMBY, M.D.,

H. H. SMITH, M.D.,

A. L. GIHON, M.D.,

H. O. MARCY, M.D., *Committee.*

—*From the Journal of the Association.*



## HOW CAN THE MEDICAL PROFESSION AID THE BOARD OF HEALTH? \*

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By JOSEPH D. BRYANT, M.D., Health Commissioner, New York.

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A SHORT time ago the presiding officer of this Academy secured from the reader a promise to present a paper at this meeting of the Academy bearing on the relations that should exist between the Health Department and the medical profession of this city. This request was made during a conference that was being held by Dr. Jacobi and myself as the Medical Commissioner of the Health Department, relative to the feasibility of the appointment of a medical Board to the Willard Parker Hospital for Contagious Diseases, and of the willingness of Dr. Jacobi to accept a position on the board. It was stated, as a reason for this step, that the profession of medicine of this city was somewhat ill-informed of the previous and present organization of the Board, of its aims, and of the methods employed for the accomplishment of its purposes. I comply with this request most willingly, since it must appear to every one that the medical profession of this city and the Health Department should act in complete harmony with each other on all matters relating to the public health. It cannot be denied, I think, that they are at present, and have been for some time, greater strangers to each other than the immediate associations of their presence and purposes warrant. The reasons for this, both presumptive and real, should form no part of this evening's discussion.

The present and the future only should concern us. Each should labor with common purposes—the prolongation of human life and the alleviation and prevention of human suffering. Indeed, it will be strange if intelligent and humane individuals, who are prompted by these common purposes, be not able to act harmoniously in the interest of common good. The Health Department deals with measures for the preven-

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\* Read before the New York Academy of Medicine, November 3d, 1887.

tion of disease rather than with those of a curative nature. The members of the medical profession necessarily devote themselves more to the cure of disease and to the alleviation of the physical distress incident to it than to the prevention of disease. Boards of health have the power to enact laws and the sanction and support of laws that are established for the purpose of affording them effectiveness in the performance of their duties ; laws which, if properly interpreted and firmly yet honestly enforced, can but beget a public sense of confidence and security in those who administer them. On the other hand, if an unwise or illogical use be made of a power to create or to enforce laws, public distrust, followed by public indignation and public revolt, soon reduces the administrative fabric to ruins, and often there lie buried beneath them, for a time, the health, the enterprise, and the prosperity of the people. The members of the medical profession are not controlled in their action so much by written as by unwritten laws, yet they are none the less amenable for the violation of lawful precepts, since confusion, distrust, and dishonor follow each other in rapid succession as the results of the violations of accepted principles. It follows, therefore, logically, legally, and properly, that the preventive means of the Health Department, supported by a just interpretation and enforcement of its sanitary laws, should command the respect, confidence, and co-operation of the medical profession, actuated by its laws, in order that the consummation of the common purposes of each may be productive of the greatest good. With the view of paving the way to this co-operation, I have selected as a suitable title for the paper of the evening, "How can the Medical Profession Aid the Board of Health?" Before proceeding to state *how* this can be done, it is but proper that the profession should be informed (1) of the previous organization of the department ; (2) of the present organization ; (3) of its purposes and the means of attaining them. From January 2d, 1884, until about August 1st, 1887, the organization was as follows :

First, Secretary's Office.

Second, Attorney and Counsel's Office.

Third, The Sanitary Bureau. This was subdivided into seven different divisions, to wit :

First Division : Charged with all sanitary matters, particularly in connection with tenement and lodging-houses, their occupants, and generally as to public buildings.

Second Division : Charged with all matters requiring the services of an expert in connection with the adulteration of food and drink, and with offensive trades.

Third Division : Charged with all matters endangering health, life, or limb upon the streets and sidewalks, and the enforcement of ordinances relating to nuisances exposed to public view, as well as special in-door inspections of all tenement and lodging-houses.

Fourth Division : Charged with all matters relating to the detection and prevention of contagion ; vaccination and disinfection.

Fifth Division : Charged with all matters relating to the care and maintenance of hospital buildings, treatment of patients therein, and their transportation to and from the same.

Sixth Division : Charged with all matters relating to the execution of the laws relating to plumbing and ventilation, construction of new buildings, and special inspections.

Seventh Division : Charged with all matters relating to the registration of births, marriages, and deaths, and the issuing of burial and transit permits.

This plan of organization was of a semi-military character, and it was intended that the subordinates of the Board should move, in the performance of their duties, with something of the precision that characterizes the systematic acts of bodies of men trained for the accomplishment of a common purpose. Suffice it to say, however, that from a practical standpoint this method of organization was soon found by the present commission to be more ornamental than useful, more confusing than assuring, and, in fact, more circumlocutory than direct in its advances.

With somewhat rapid strides changes were instituted by the present commission, which, it is believed, has greatly increased the scope and efficiency of the work of the department. Not a little of the success that has thus far attended these changes depends on the renewed *esprit de corps* of those who are entrusted with the execution of the duties of the department.

The following is the plan of organization at the present time :

(1) Secretary's Office ; (2) Attorney's Office ; (3) Sanitary Inspection ; (4) Contagious Diseases ; (5) Food and Drink Adulteration, and Food Inspection ; (6) Plumbing and Ventilation and Construction of New Buildings ; (7) Vital Statistics.

The first decided change that was made was the transfer of Dr. Roger A. Tracy to the position of Registrar of Vital Statistics. Dr. Tracy is believed to be particularly well fitted for the duties of this position, by reason of his sound education and the natural inclination he has for this kind of work.

At the same time the first and the third divisions were consolidated, and placed in charge of the inspector who formerly had control of the third division only.

The great majority of the sanitary inspections and the search for nuisances are done by lay sanitary inspectors and police sanitary inspectors. Of the former there are forty-two ; of the latter, fifteen. For the purposes of police sanitary inspection the city is divided into forty-two separate districts, on a basis of equality of work and individual responsibility. A sanitary policeman is placed in charge of each of these districts. His duties consist in making a thorough inspection of the tenement-houses of his district, making complaints for the abolition of all nuisances, and attending to such other duties as may be required of him by the department. The lay sanitary inspectors are men who are selected on account of the education, intelligence, or experience they possess. Their duties are, to attend to the citizens' complaints, and to inspection-problems that are too difficult for the police sanitary inspectors. They are also to correct special nuisances that occur, in connection with many other buildings than tenement-houses, in their districts.

There are fifteen lay inspectoral districts in the city, which are so arranged as to meet the demands of time and sanitary requirement in the performance of the duties of each. At the present time the medical sanitary inspectors are detailed to the department of contagious diseases, and devote their time exclusively to examining and combating all contagious diseases that come to the notice of the department. They are directed to visit the location of a contagious disease at once, to examine the premises closely for the detection of any de-



fects that may be associated with the development or propagation of contagious disease, make complaints against defects, and afterward see that a strict compliance with the orders of the board regarding them be enforced. They are likewise told to offer disinfectants, instruct in their use, and observe if they be properly employed. They are directed to enjoin suitable isolation and observe that it be maintained.

They warn the people of the existence of contagious disease in their dwellings, and advise them of the necessity of avoiding exposure to it. Finally, they trace the disease to its source, and, by doing so, they not infrequently uncover a rich mine of unsuspected contagion. When it is impossible to provide and maintain proper isolation or proper medical treatment, the affected ones are requested to go to the hospital of the department. If the diseased persons be in contact with business proceedings, as a place for the active sale of commodities of any kind, it is required that the business place be closed or that the patients be removed. The medical inspectors engaged in this duty are emphatically told that they must co-operate with the physicians in charge of the patients, in every instance, and to do so with the strictest professional courtesy to the hospital.

It is intended to cause a careful scrutiny to be made, at no distant date, of phthisis and other diseases of a similar nature. The long experience of the medical sanitary inspectors as nuisance-searchers and examiners of citizens' complaints, taken in connection with the fact of their being educated physicians, makes their work in these matters of great importance, and causes it to be skilfully performed. The placing of the medical sanitary inspectors at legitimate medical work, instead of retaining them at duties that are not infrequently inconsistent with all the instincts of educated gentlemen, can but increase their *morale* and efficiency. And it affords them the opportunity to investigate disease, the consideration of which has formed the basis of their life-study. The salaries of these and other positions have been graded in a manner that will offer a financial encouragement for a performance of duty that will be measured entirely by their own worthiness. The division of contagious diseases includes the bureau of vaccination and the consideration of contagious diseases in animals. This division

has two special diagnosticians of contagious diseases, and no patient is removed to a hospital of the department unless the diagnosis have been made, or confirmed, by one or both of these gentlemen. And finally, to throw every possible safeguard around suspected cases, the Health Commissioners have appointed Dr. Prudden, of the College of Physicians and Surgeons, and Dr. Biggs, of Bellevue Medical College, as pathologists of the Health Department and of the hospitals under its charge. And it is but proper to say, at this time, that these gentlemen have proven the value of their services and the wisdom of the selection already in diagnosing cholera by developing its cultures from the contents of the intestine of a suspected case at quarantine. The department has ample and comfortable means for the conveyance of patients to its hospitals, for all ordinary emergencies.

The hospital-accommodations are likewise adequate for the present need. Believing that the extent and character of the hospital-accommodations of the department are not appreciated by the majority of the members of the medical profession of this city, I will take the liberty of encroaching on your time sufficiently to briefly outline them. At the foot of East Sixteenth Street there are located the Willard Parker Hospital, for the treatment of contagious diseases, and also the reception-hospital for the patients who are under observation, and for the temporary abode of those to be removed to North Brothers' Island. The Willard Parker Hospital is an imposing brick structure, with good appointments, and with ample accommodations for seventy-five or one hundred patients. It is now occupied for the treatment of diphtheria and scarlatina only. And when you are told that the general care of the patients is supervised, at present, by a medical board composed of Drs. E. G. Janeway, A. Jacobi, C. R. Agnew, Stephen Smith, D. M. Stimson, G. F. Shrady, and J. D. O'Dwyer, it requires no further words on the part of any one to indicate to all concerned that no pains is being spared to make the hospital worthy of the fullest confidence. The house-physician, too, is experienced and faithful to every trust. The reception-hospital is likewise under the supervision of this medical board. Ordinarily, it is occupied by two or three patients, and is sufficiently spacious for usual requirements.

However, if the resources of this building were to be tested by the occurrence of an epidemic of other than the eruptive fevers, it would be found sadly inadequate in respect to capacity, safety, and comfort. Still, it is confidently believed by the Commissioners of the Health Department that their recommendations in such an emergency would be supported by the public authorities with a degree of earnestness that would render these defects generally remediable. On North Brothers' Island there is a suitable building for the treatment of small-pox, and also five completed pavilions for other contagious diseases. The pavilions will accommodate twenty-five to thirty patients each, with safety and comfort. There is also a considerable area of unoccupied surface upon which temporary structures could be erected if need be. The capacity for cooking is ample, and the utensils for eating abundant; the stock of clean clothes is liberal, and the preparations for disinfection are not contracted. It is now contemplated to provide disinfecting apparatus of sufficient capacity to enable the department to disinfect all textile fabrics that may have become associated with any form of contagious disease. This course is deemed to be absolutely essential to a successful struggle with this class of diseases, especially in the populous portions of a tenement-house community. Steps have been taken lately to render the reporting of contagious diseases and births, by the members of the profession, of as little expense as possible to them. However, candor compels us to state at this time that this course was taken, not only to relieve the members of a tax which appeared to be an unwise if not an unjust one, but also to disarm criticism on the part of those against whom the department may take action in the future for failing to comply with some of the legal requirements connected with contagious diseases.

As has been said already, in speaking of the transfer of the medical sanitary inspectors, great attention is being given to contagious diseases by the department at the present time. It is believed that, with a prompt reporting of contagious disease by the medical profession, combined with a cheerful and earnest co-operation with the board, that the contagious diseases of this city can be substantially abolished.

While the number of deaths from diphtheria per annum in



this city is startling, yet the common occurrence of the funerals of the innocent victims of this disease has so familiarized the people with the grim spectre, that a mental estimate of the size of the coffin, attended by a casual remark of the death of a child, constitute the greatest part of the public sentiment that is excited by the funeral cortége. But if only one case of cholera were to happen within the city limits, gratuitous advice, gratuitous animadversion, and contumely would be heaped indiscriminately on the blameless and the guilty. It would be said that the commercial interests of the country; the business prosperity of the city, and every other interest dear to man, were imperilled ! And all of this would be true, and on account of one case of cholera.

Still, there is scarcely a pronounced recognition from like sources of an annual childhood death-rate from preventable diseases that eclipses any epidemic of cholera from which this city will ever suffer. The existence of cholera interferes with business interests, threatens the prosperity and lives of adults, imperils the selfish rather than the sentimental interests of men. When I inform you that it is estimated that at least fifteen to twenty-five per cent of the cases of contagious diseases in this city are not reported, you will then see the great odds against which the Health Department must contend if it fight the existence of contagious diseases successfully. And I ask you, my medical friends and Fellows of the Academy, who is to blame for the influence of this proportion of the disparity of the conflict ? It is estimated, also, that twenty-five to thirty per cent of births remain unreported.

The permanent vaccinating corps comprises eight physicians. A few other physicians are appointed temporarily for this purpose, from time to time, as circumstances require. Vaccination is not enforced in any instance ; yet, under some circumstances, it has been deemed advisable to use threats, and even a more active semblance of authority than these, to cause its acceptance, especially when great exposure has taken place in populous neighborhoods.

The Health Department can exercise as strict supervision of the food and drink commodities as the limited help for the duty will admit. A practical chemist is now in charge of this branch of the service.



The construction of tenement-houses as regards light, ventilation, and plumbing come within the jurisdiction of this department ; and the prepared plans of construction of these habitations are submitted to the department for approval or disapproval. Any detection of a violation of the requirements of the law on the part of the architect or the owner results in the immediate correction of the construction, or in the arrest and punishment of the guilty parties. For the purpose of detecting illegal acts in connection with construction, the board employs a number of sanitary engineers, who are appointed for this purpose by reason of their special fitness for this line of duty. The premises are visited frequently by them, the approved plan of construction is compared with the plan in use, and whenever the latter differs from the former a halt is ordered and a strict compliance with the approved plan is then enforced. I could entertain you for some time with narrations of the shrewd, and often humorous, efforts that are made by the agents of builders to circumvent the requirements of the Board. Not infrequently the misguided plumber will apparently ventilate the waste-pipes through the roof, by fastening to the roof directly an upright piece of pipe, which stands erect in the formal manner of a ventilated waste-pipe, but in reality is connected with nothing below the roof, except, perhaps, with the unsophisticated imagination of a newly-appointed inspector. The Bureau of Vital Statistics is familiar to you all, for obvious reasons. In this division many preventive and precautionary measures against disease have been instituted, among which may be mentioned the requirement of an immediate and permanent enclosure of the body of a person dead of contagious disease within a tight casket. So much, in brief, can be said of the practical working of the Health Department from a medical standpoint alone. There is much more than this, but it must remain unrecited, both from want of time to express it and from the unimportance of its bearings upon the direct interests of the medical profession.

*How the medical profession can aid the Board of Health.*—The profession can aid the Board of Health in a most signal manner :

1. By reporting to the department at once all varieties of nuisances of which the members may become cognizant, that

are recognized to be dangerous to life or detrimental to health.

2. By reporting all forms of contagious diseases at once, to enable the Health Department to apply quickly all possible means to prevent their spread. By doing this many valuable lives can be saved in ordinary times, and the occurrence of epidemics may be prevented.

3. By enjoining strict isolation of the patients and thorough antiseptic measures in contagious diseases.

4. By reporting to the Board at once, for removal to the hospital, all cases of contagious diseases in which isolation cannot be practised or where adequate treatment cannot be provided.

5. By visiting the Willard Parker and other hospitals of the department at reasonable hours, to be able to inform the unfortunate sick of the admirable accommodations provided by the city for their relief and comfort.

6. By discouraging the visits of the sick of contagious diseases to the dispensaries of the city. This act alone exposes to disease a large number of innocent persons, and is not a wise act for those already afflicted.

7. By co-operating with the medical inspectors of the Board in every consistent manner, in the fight against contagious diseases.

8. By reporting to the Board all food and drink adulterations that may come to notice.

9. By reporting all diseased or decayed food-substances to the Board that may be known to the profession.

10. By giving attention to the subjects of plumbing, light, and ventilation in human habitations, and reporting to the Board any violations of the law in respect to them.

11. By giving attention to plumbing construction, especially to be able to detect for yourselves and to inform your patients of the escape of deleterious gases into living and sleeping rooms.

12. By reporting births promptly, that the records of the department may show a correct annual birth-rate; also, to enable the department to locate those who may require vaccination.

13. By the appointment of a conference committee from

your numbers, at once, of not more than five (5) members, which committee shall confer with the Health Department on all matters of health relating to the general public, when requested.

In making this statement, the Commissioners of Health feel that it is but proper that two organizations having the influence for good and the strength to enforce healthy doctrines, together with common personal interests in the public welfare, that are possessed by both the medical profession and the Health Department, should work harmoniously and actively together in the common cause—the present and prospective healthfulness of this great city.—*The Medical Record*, November 12, 1887.

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POISONING FROM EATING CUSTARD PIE.—In August last three of four persons ate of a custard pie that had been bought at a small bake-shop in this city. The custard was of milk, eggs, and sugar. A flat, mawkish taste was present, which the addition of sugar did not improve; consequently only a small portion of each piece served was eaten.

An hour or two after eating it pain in the bowels began, and increased in violence until a sharp diarrhoea resulted with nausea and vomiting. The vomited matters soon appeared free of food particles, becoming whitish, frothy, and of a peculiar flat, alkaline taste. The stools were like rice-water, copious, and free from fecal matter after the first two or three evacuations, and were attended with sharp pains. In spite of treatment, this active state of affairs continued from three to five hours. Complete cessation did not take place under twenty-four hours from eating the pie, and the resulting abdominal tenderness lasted in two of the cases some time longer. No thirst and no fever attended the attack.

The fourth person, who ate no pie, had no illness. The pie was evidently at fault, as what remained soon betrayed its staleness. It had been kept on ice in an ordinary ice-box no telling how long. The cold and the exclusion of air had prevented vinous fermentation, that so readily betrays its presence, and had probably favored the development of ptomainic poisons.

E. H. ROOT, M.D.

CHICAGO, ILL., December 26, 1887.

THE INFLUENCE OF EASY CIRCUMSTANCES ON  
LONGEVITY.

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By DR. C. R. DRYSDALE, of London.\*

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THE author said that Villermé, of Paris, was one of the first to show that comfort prolonged life greatly, by showing that between the ages of forty and fifty years persons in good circumstances, in Paris, had a death-rate of 8.3 per 1000 against one of 18.7 per 1000 of persons of similar ages among the poor ; and he also found that in Paris, between 1817 and 1836, 1 in 15 of the population of the poor arrondissement died annually, against 1 in 65 in the second, or rich, quarter. Mr. Chadwick had shown that in London there were some sub-districts of the wealthy classes where the death-rate did not exceed 11.3 per 1000 annually, while there were localities (slums) where it rose to 38 per 1000. In 1843, when the general London death-rate was 24 per 1000, that gentleman found, in Bethnal Green, that the mean age at death of the gentry and professionals was forty-four years against twenty-two years among the artisan class ; and recently, when the death-rate among the gentry was about 55 in England and Wales, that of the artisan class in Lambeth was 29.5. In 1874 Mr. C. Ansell, of the National Insurance Company, found that only eight per cent of the children of the upper classes died in their first year, against nineteen per cent in the general population of Liverpool, and thirty-three per cent in the slums of that and other large cities. Ansell had concluded that, whereas there died in England and Wales, in 1874, 368,179 persons under the age of sixty years, if the mortality had been equal to that of the rich, only 226,040 would have died, so that poverty in one year had killed 142,139 persons. Dr. Thouvenin had truly remarked that with the exception of cotton-beating, dividing, and carding silk cocoons, white lead, and grinding, there are scarcely any trades necessarily dangerous

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\* Read before the British Medical Association, August 5th, 1887.



to life ; but he found that the deaths from consumption were nearly one fourth of all deaths among the poor, and only, or about one eighteenth of all deaths among the rich. Dr. Edward Smith's statistics at the Brompton Consumption Hospital of London, which he had verified at the North London Consumption Hospital, showed that his patients had been the offspring of parents who, on an average, had produced seven children each, and, as such children were ill-fed, they succumbed more easily to that disease. In the wealthy parishes of Kensington, London, with 186,584 inhabitants, Saint George, Hanover Square (88,176), Hampstead (53,758), Saint James, Westminster (28,178), had, in 1886, collectively, 7779 births and 5614 deaths—*i.e.*, a birth-rate of 21.8 and a death-rate of 16 per 1000 ; while the poor parishes of Shoreditch (125,508), Bethnal Green (129,895), Whitechapel (68,345), and St. George-in-the-East there was, in 1886, a birth-rate of 38.3 and a death-rate of 24.4 per 1000. Thus, the poor in London had nearly twice as many children as the rich, and consequently their death-rate was to that of the rich as 3 to 2. The high death-rate of Dublin (26.5) was now explained by Dr. Grimshaw's statistics to be due to poverty, for the richer classes in that city have an annual death-rate of 13.4 per 1000, against the artisan class, which has 33.7. The percentage of children among the rich in Dublin was seven, and among the poorer classes nearly fifteen, below the age of five years. The low death-rate of the Champs Elysées, at Paris, as compared with the poor twelfth arrondissement, is understood when we know that in the poor quarter children under five years existed to the amount of 957, against 397, in the rich quarter, per 10,000 inhabitants. In 1887, when he, Dr. Drysdale, was vice-president of one of the sections of hygiene at Paris, he found that 100 medical men in Paris produced only 174 children, whereas the average number of children in the poor quarters of Paris in a family, according to M. Haussonville, was 6, and in Paris he had found 7.20. The great economist, Mr. J. S. Mill, said that "little improvement could be expected in morality until the producing of large families was regarded in the same light as drunkenness," and all enlightened hygienists would re-echo that sentiment. For his, Dr. Drysdale's part, he was convinced that the health of the poorest classes would

never be satisfactory until they were prevented, by public opinion, or, better still, by statute law of some kind, from engendering such enormous and unfortunate families. And if he was right in this opinion, what would the Section say to the conduct of the Fellows of the Royal College of Physicians of Edinburgh, who, in February last, had threatened one of their members, Dr. Henry A. Allbutt, of Leeds, with expulsion from the list of members of the college, because he had explained, in a sixpenny pamphlet to the poor, the simple and harmless methods, now known to all enlightened citizens, whereby they might restrain the number of their children within the powers of their industry to rear them? It was a disgrace to a body of educated men to be so silly and so inhuman, and he sincerely trusted that they had already repented, and would ask the pardon of Dr. Allbutt.—From the report of *The Medical Record*.

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“CLASS MORTALITY STATISTICS.”—In the population of Dublin, containing 346,603 persons, a division was made into five classes, as follows: Professional and independent (30,129), middle class (56,781), artisan class and petty shop-keepers (106,142), general service class (147,625), and inmates of workhouses (6036). The different classes had, first, 2247 children under five years in the ranks of Class I.; 6188 in Class II.; 12,895 in Class III.; and 16,111 in Classes IV. and V. This gives the various percentages of children under five years as 7 in I.; 11 in II.; 12 in III.; and 14.5 in IV. and V., thus following the law that the poor are much more prolific than the rich. The death-rate for the various classes above cited is as follows: In Class I. it was 13.4 per 1000; in Class II., 27.3 per 1000; in Class III., 22.3 per 1000; and in Classes IV. and V., it was 33.7 per 1000.—*From a paper read by Dr. Grimshaw, Registrar-General of Ireland, before British Medical Association, August 5th, 1887.*

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## THE OHIO STATE SANITARY ASSOCIATION.

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E. T. NELSON, Ph.D., President, Delaware, O.

R. HARVEY REED, M.D., Secretary, Mansfield, O.

PRELIMINARY PROGRAMME of the fifth annual meeting of the Ohio State Sanitary Association to be held in the Grand Army Republic Hall, corner Adams and Ontario streets, Toledo, O., on Thursday and Friday, February 9th and 10th, 1888.

Thursday, February 9th, First Session, 9 A.M.

"Sanitation in Architecture," by D. L. Stine, Esq., architect, of Toledo. Mr. Stine's paper will be discussed by Mr. Francis C. Bodine, architect, of Mansfield; Drs. E. R. Eggleston, of Mt. Vernon; A. E. Evans, of Columbus, and J. N. Huntsberger, Esq., of Toledo.

"Cremation as a Sanitary and Economic Measure," by Lew Slusser, M.D., of Canton. This paper will be discussed by Drs. S. H. Smith, of Warren; A. W. Hopkins, Health Officer, of Ashtabula; E. Westlake, Health Officer, of Gallipolis, and A. T. Quinn, of Wilmington.

"Children's Homes and Orphan Asylums," by F. H. Darby, M.D., Secretary of Board of Charitable and Correctionable Institutions, of Morrow. Dr. Darby's paper will be discussed by Dr. A. G. Byers, Member State Board of Charities, of Columbus; Hon. M. J. Cooney, of Toledo, and General R. Brinkerhoff, Member State Board of Charities, of Mansfield.

"Hygiene of the School-Room," by F. C. Larimore, M.D., Member Board of Education, of Mt. Vernon. This paper will be discussed by Drs. T. Clark Miller, Health Officer, of Massillon; L. G. Thacker, of Defiance, and J. C. Fahnstock, of Piqua.

"Effects of the Present Educational Methods on the Health of Women," by C. A. Lee Reed, M.D., Professor of Diseases of Women, Cincinnati College of Medicine and Surgery, of Hamilton. Professor Reed's paper will be discussed by Professor E. T. Nelson, Ph.D., of Delaware; Dr. W. J. Conklin,

of Dayton, and Professor C. H. Reed, of North-western Ohio Medical College, of Toledo.

The afternoon session will open at 1 o'clock P.M., with a paper on "The Necessity of Uniform Means of Reporting to Health Departments," by W. J. Scott, M.D., Professor of Clinical Medicine, of Cleveland. Dr. Scott's paper will be discussed by Drs. Byron Stanton, Health Officer, of Cincinnati; J. M. Weaver, Health Officer, of Dayton; F. Gunsaulus, Health Officer, of Columbus, and G. A. Collamore, Health Officer, of Toledo.

"Village Boards of Health," by Austin Hutt, M.D., of Waverly. Dr. Hutt's paper will be discussed by Drs. W. S. Jones, of Waverly; J. W. Cooper, of Bellaire; C. C. Fulton, Health Officer, of Portsmouth, and W. L. Buechner, Health Officer, of Youngstown.

"Boards of Health and their Relation and Duties to the Public," by J. A. Martin, M.D., of Findlay. Dr. Martin's paper will be discussed by Drs. Anson Hurd, of Findlay; H. J. Sharp, Member State Board of Health, of London, and George L. Hoege, of Fostoria.

"The Duty of the Public to Sanitary Science," by G. A. Collamore, M.D., Health Officer, of Toledo. Dr. Collamore's paper will be discussed by Dr. D. R. Silver, Member of the Board of Health, of Sidney; Professor John Simpson, Superintendent of Schools, of Mansfield; Dr. H. L. Wenner, of Tiffin, and Dr. F. W. Brayton, of Carey.

"House Drainage and Sewer Connections," by William Owens, M.D., of Cincinnati. Dr. Owens's paper will be discussed by Drs. A. A. Elliott, Health Officer, of Steubenville, and H. E. Beebe, of Sidney; Mr. Thomas McNeal, Master Plumber, of Cincinnati; Mr. William Halley, Master Plumber, of Columbus.

"The Ventilation of Sewers," by John McCurdy, M.D., Member of the Board of Health, of Youngstown. Dr. McCurdy's paper will be discussed by Dr. H. J. Herrick, Surgeon-General of Ohio, of Cleveland; Mr. Frederick G. Halley, Master Plumber, of Columbus; Mr. A. G. Daykin, Master Plumber, of Cleveland, and Mr. James Semple, Master Plumber, of Cincinnati.

The evening session of the first day will be held in Memorial Hall, and will open at 7 o'clock.



His Honor, J. Kent Hamilton, Mayor of Toledo, will deliver an Address of Welcome, which will be responded to by Professor Edward Orton, State Geologist, of Columbus.

After the Mayor's Welcome, Professor Victor C. Vaughan, M.D., of the University of Michigan, will give an address. Next will follow the President's Annual Address, on

"The Duty of the Hour," by E. T. Nelson, Ph.D., Professor of Physiology and Geology, Ohio Wesleyan University, of Delaware.

The second day's proceedings will begin at 9 A.M., with a paper on "The Heating and Ventilation of Passenger Coaches," by R. Harvey Reed, M.D., of Mansfield. Dr. Reed's paper will be discussed by Professor Curtis C. Howard, Medical School of Columbus; W. J. Scott, M.D., of Cleveland, and J. Ernst Hackl, M.D., of Toledo.

"On Some Points in the Examination of Air," by Curtis C. Howard, Medical School, Professor of Chemistry, Starling Medical College, of Columbus. This paper will be discussed by Drs. E. W. Morley, A.M., Ph.D., Professor of Chemistry, University Western Reserve, of Cleveland; F. W. Blake, A. M., Professor of Chemistry, Columbus Medical College, of Columbus, and William Dickore, A.M., Ph.D., Professor of Chemistry and Toxicology, Cincinnati College of Medicine and Surgery, of Cincinnati.

"Pure Air within Doors and How to Obtain It," by Professor P. W. Search, Superintendent of Schools, of Sidney. Professor Search's paper will be discussed by Drs. W. J. Scott, Member of the Board of Health, of Cleveland; C. E. Kurz, of Bellaire; John T. Stutphen, Health Officer, of Middleton, and H. Hendrixson, of Columbus.

"How Far has the Science of Ventilation Advanced?" by Isaac D. Smead, Esq., of Toledo. This paper will be discussed by Drs. D. R. Silver, Member of the Board of Health, of Sidney; C. L. Van Pelt, M.D., Professor of Hygiene and State Medicine, North-western Ohio Medical College, of Toledo; D. H. Beckwith, Member of the State Board of Health, of Cleveland, and T. Clark Miller, Health Officer, of Massillon.

After the reading of Mr. Smead's paper, the Association will adjourn to visit a school building demonstrating the paper.

The afternoon session will open at 1 o'clock, with a paper on "Should Syphilis be Made a Legal Bar to Matrimony?" by A. H. Brundage, M.D., of Xenia, and C. E. Beardsley, M.D., of Ottawa. This paper will be discussed by Drs. J. F. Baldwin, Editor of *Columbus Medical Journal*, of Columbus; John McCurdy, Member of the City Board of Health, of Youngstown; J. B. Vail, President of the North-western Ohio Medical Association, of Lima.

"Cholera: Its Causes, Non-Contagiousness and Method of Prevention," by D. H. Beckwith, M.D., Member of the State Board of Health, of Cleveland. Dr. Beckwith's paper will be discussed by Drs. G. C. Ashmun, Health Officer, of Cleveland; S. P. Wise, Member of the State Board of Health, of Millersburgh, and J. W. Craig, First Vice-President of the Ohio State Medical Society, of Mansfield.

"The Germ Theory the Correct One for the Contagious Endemic and Epidemic Diseases," by A. G. Longfellow, M.D., of Fostoria. This paper will be discussed by Drs. H. M. Lash, of Athens; C. P. Landon, of Westerville; S. L. McCurdy, of Dennison, and G. F. Cook, Superintendent of the Insane Asylum, of Oxford.

"Meat Poisoning," by John A. Chesney, M.D., of Bucyrus. This paper will be discussed by Drs. J. U. Barnhill, B.S., Lecturer on Toxicology, Columbus Medical College, of Columbus; Ellwood Stanley, United States Marine Hospital Service, of Sandusky; Toland Jones, of London, and H. Hathaway, of Toledo.

"The Necessity for Attention to Mental Hygiene in Our Public Schools," by John C. McClurg, M.D., Mayor, of Leipsic. This paper will be discussed by Drs. C. M. Finch, Superintendent of the Insane Asylum, of Columbus; Thomas W. Gordon, of Georgetown; R. C. Stockton Reed, A.M., Professor of Materia Medica, Therapeutics, and State Medicine, Cincinnati College of Medicine and Surgery, of Stockton, and James G. Nolen, Professor of Mental Diseases, Toledo Medical College, of Toledo.

The headquarters of the Association will be at "Hotel Madison."

All persons interested in the promotion of the public health are invited to be present.

Special rates on all railroads centring at Toledo have been secured for the benefit of those attending the meeting.

For additional information, address

R. HARVEY REED, M.D., Secretary,  
Mansfield, O.

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A SOUTH AMERICAN SANITARY CONVENTION  
—SLAVERY IN BRAZIL.

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RIO JANEIRO, December 12, 1887.

THE Sanitary Convention, signed by the technical delegates of Brazil, Uruguay, and Argentine, has been made public. Yellow-fever, cholera morbus, and the plague, are the three exotic pestilences treated of, and the articles considered pestiferous are clothing, cloth, rags, mattresses, and objects of personal use, also the boxes containing them, and fresh hides. No other articles are to be considered as suspected. Each party undertakes to found a lazaretto, and to establish in time of pestilence at least one floating hospital. Quarantines or other sanitary measures undergone in the lazaretto of any of the three Powers are valid for all the others. The closing of ports to vessels from abroad is prohibited, and no vessel is to be driven away, no matter what disease prevails aboard. Packets, and other steamers carrying emigrants, must have a doctor, and be supplied with a steam disinfecter, medicines, and disinfectants, keeping, besides, regular books of record. A corps of ship sanitary inspectors is to be established by each Power, to embark in vessels, fiscalize the execution of the sanitary provisions, and report on all occurrences during the voyage. Strict quarantine is limited to ten day for yellow-fever, eight for cholera, and twenty for Eastern plague, and the time may be counted from the date of last case on board, if duly verified.

Still another rising of one hundred and fifty slaves has taken place on a plantation, requiring the despatch of a military force. This shows that the spirit of insubordination is actively working among the Sao Paulo slaves. The planters, seeing themselves virtually without power to cope with the frequent risings and stampedes to the forests, seem to recognize the inutility of maintaining a struggle. The majority resignedly but frankly admit that the final blow to slavery will be dealt in next year's Imperial Legislature.

EDITOR'S TABLE.

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THE ACADEMY OF MEDICINE COMMITTEE'S REPORT ON QUARANTINE, intended for this number, is unavoidably postponed to the next, which will quickly follow, in consequence of the delay of the engraver in the preparation of the cuts with which it will be illustrated.

## BROOKLYN'S NEW HEALTH COMMISSIONER, WITH SOME SUGGESTIONS.

JOHN GRIFFIN, M.D., recently appointed Health Commissioner of Brooklyn, by Mayor Chapin, to succeed Andrew Otterson, M.D., is a new addition to sanitary service.

He graduated from the Queen's University of Ireland, in 1863, but continued to hold a scholarship in that institution until 1866.

He emigrated to the United States in 1867, and soon thereafter became connected with the metropolitan press, upon which he served in various capacities—as reporter, editorial writer, and correspondent. During the same time he studied medicine and attended medical lectures at Bellevue Hospital Medical College three terms, and received his degree of M.D. from that institution in 1873. Shortly thereafter he settled in Brooklyn, where he has been engaged in general practice ever since. He is a member in good standing of the Kings County Medical Society, though he has not taken a very active part in the proceedings. Recently, however, he has become particularly known by his activity in the Board of Education, to which body he was appointed by Mayor Low, at the beginning of his administration in 1880, by whom he was also reappointed for a second term, and again appointed for a third term by Mr. Low's successor, Mayor Whitney. This record at least attests the high appreciation of his services by the appointing powers in that approximate sphere of labor to the one of which he is now made the chief.

At the outset of his service in the Board of Education, he



was made a member of the Committee on Health, and subsequently Chairman of that Committee. He has been active in the promotion of school sanitation in several ways, and meanwhile he has been largely instrumental in bringing to a successful conclusion the scheme whereby the free-book system has been introduced into the public schools of the city.

On such a record is predicated the belief that he will ere-long make himself familiar with the requirements of the Health Department. In it he will find a much larger scope for the exercise of whatever skill he possesses as an executive officer than he has ever had opportunity to display hitherto.

It may be safely said of the department, as turned over to him by his predecessor, he will find it not only in good working order, but equipped, for the most part, with an effective *personnel*, though doubtless susceptible of improvement.

To his predecessor belongs the credit of being the first to secure laws for the regulation of plumbing, which, though less elaborate than they should have been, are among the best plumbing regulations anywhere in vogue. In the practical operation of these laws the power seems to be lacking for the inspection and correction of defective plumbing constructed before the said laws went into effect, which is unquestionably one of the most fruitful sources of preventable diseases now prevalent in Brooklyn. It is evident, therefore, that the laws need elaboration, or such additional city ordinances as will extend their power. Another fruitful source of disease in Brooklyn (probably for the want of a sufficient number of inspectors in the Health Department) are the overcrowded and unventilated workshops of all sorts of trades, for the most part equally as bad as, and some of them in a worse condition than the tenement houses, which require continuous surveillance. Moreover, the chronic, artificially-made "sunken lots," factory nuisances, and stables are at all times to a greater or less extent standing witnesses of the degree of attention given by the Health Department to that portion of the community who have no regard for the health and comfort of their neighbors. Such are some of the things, conditions, and individuals by which the efficiency of the new commissioner will be measured, as compared with those who have preceded him.

## MORTALITY AND MORBILITY STATISTICS AT THE MOST RECENT DATES.

CALIFORNIA.—The Secretary reports from 84 towns, in which deaths occurred during the month of October, a mortality of 1040 in an estimated population of 770,450, which gives an annual rate of 15.56. "This is an increased mortality from the preceding months, and singularly corroborates the opinion of Dr. H. B. Baker, the accomplished Secretary of the State Board of Health of Michigan, that meteorological conditions influence the death-rate in a marked manner, especially in diseases of the respiratory organs and other mucous outlets of the body." The prevailing causes of death were : Consumption, 48, an increase of 50 per cent over the mortality of September from this disease ; pneumonia and congestion of the lungs, 71, more than 100 per cent increase over the mortality of the preceding month. This can only be accounted for by meteorological conditions which are not readily comprehended or satisfactorily solved as yet ; bronchitis, 11 ; diarrhœa and dysentery, 23, an increase of 20 over the mortality for September ; cholera infantum, 51, a large increase over last report ; diphtheria and croup, 41, 25 of which occurred in San Francisco.

Measles is reported in Merced, Downey, Downieville, Elk Grove, Sacramento, Oakland, Hill's Ferry, Madera, Anderson, Santa Monica, Cottonwood, Santa Cruz, San Rafael, and San Francisco.

Scarlet-fever in San Francisco, Sacramento, San José, Monterey, Rocklin, Sissons, Cottonwood, Pomona, Nicolas, Fresno, Madera, and Fort Bidwell. The type is very mild, and shows no tendency to become epidemic.

Small-pox still exists in San Francisco, 6 cases being reported during the month. One case appeared in Oakland ; no other cases have been reported in the State.

Diphtheria and croup prevail to some extent in San Francisco. It is also present in Oakland, Sacramento, Santa Ana, Suisun, Wheatland, Watsonville, Livermore, Elk Grove, Madera, Igo, Colfax, Soledad, Dixon, Vallejo, Rocklin, Sissons, and Truckee.

Whooping-cough prevails in San Francisco, Oakland,

Fresno, Bakersfield, Elk Grove, Knight's Ferry, Igo, and San Mateo.

Erysipelas was observed with some frequency in Merced, Santa Cruz, Redwood, Anderson, Lincoln, San Diego, Modesto, Truckee, Igo, Hopland, and Fort Bidwell.

Typhoid-fever is noticed as being present in San Francisco, Oakland, Pasadena, Etna Mills, Pomona, Placerville, Sacramento, San Pedro, Yreka, Colton, Igo, Nicolas, Santa Cruz, Gonzales, Santa Ana, Calistoga, Alturas, Fort Bidwell, Sissons, Anaheim, and Truckee. Dr. Ellis, writing from Elsinore, says that they had several cases of fever there that very much resembled typhoid, except that no deaths occurred from it.

CONNECTICUT. — The Secretary's report of mortality throughout the State, and particularly in the twenty-eight towns of more than 5000 inhabitants, each aggregating 454,400, during the month of October, shows that the health of the State is better than for any month since June. The death-rate being only 15.25 per 1000 of the population, which in July was 27., in August, 22.3, and in September, 17.5.

Of the towns reporting sickness only two report more than in the previous month or in the corresponding month of previous years. Eleven towns report about the same as in preceding month, and 5 the same as in previous October. Nine report less sickness than in preceding month, and 10 report less than in the same month of former years. While the average death-rate in the large towns is even a little less than in the small ones, yet there is a very notable difference in the percentage of deaths under five years old to the total mortality. In the large towns of over 5000 inhabitants it is 25.3; in the towns of less than that population it is only 7.6.

Of deaths from zymotic diseases there were from measles, only 3; scarlet-fever, 4; diphtheria and croup—the most fatal—68; whooping-cough, 1; typhoid-fever, 25; diarrhoea, 43 cases, 30 of which were under five years of age.

*Consumption*, as usual, was more fatal than any other one disease. One hundred and ten deaths were attributed to it. Among the large towns Bristol, Groton, New Britain, and Winchester reported no deaths from this cause.

Of the 124 towns reporting deaths, 84 report no deaths under five years of age. If every registrar has been careful to report all deaths under that age, the exemption is a noteworthy fact.

DELAWARE.—*Wilmington* reports for the month of October 90 deaths in a population estimated at 57,000, of which 35 were under five years of age, representing an annual death-rate of 18.95 per 1000. From zymotic diseases there were 12 deaths, and from consumption, 10.

ILLINOIS.—*Chicago* reports for the month of October 1163 deaths in a population estimated at 760,000, of which 481 were under five years of age, representing an annual death-rate of 18.37 per 1000. From zymotic diseases there were 294 deaths, and from consumption, 105.

*Rock Island* reports for five weeks ending October 29th, 22 deaths in a population estimated at 13,655, of which 10 were under five years of age. Death-rate, 16.7 per 1000. From zymotic diseases there were 11 deaths, and from consumption, 1.

IOWA.—The *Bulletin* reports the death-rates of Des Moines and Davenport, with populations of 35,000 and 23,830, for the month of October, respectively, 1.9 and 1.6; and the number of deaths in Keokuk, population, 14,000, during the same period, 14. Of the total number of deaths in Davenport (21), 7 were from diphtheria and 5 from consumption. Twelve were under five years of age.

LOUISIANA.—*New Orleans* reports for October 368 deaths in 176,500 white population, and 180 deaths in 66,250 colored population—making the respective death-rates 25.01 and 32.60 per 1000, and 27.08 for the whole population of 242,750. The deaths from zymotic diseases numbered 111, and from consumption, 56. There were 206 deaths under five years of age.

MAINE.—The *Sanitary Inspector* for November remarks upon Portland's opportunity to try the efficacy of preventive measures in cases of contagious diseases, there having been reported in that city during the month of October 44 cases of diphtheria, 14 of scarlet-fever, and 18 of typhoid-fever :



“Through the cordial co-operation of all the physicians, early report is made to the Board of any case of contagious disease. The Secretary immediately makes out a report of the case for information of the schools, one on a card especially intended for the Superintendent of Schools, the other on State blank form 3, that teachers may know the law relating to the case; these cards are handed to the truant officer, who calls at the Secretary's office twice a day for that purpose. The Health Inspector is informed of the case, and he at once goes to the house where the case is reported, and puts at front and rear entrances a card stating that diphtheria, or scarlet-fever, as the case may be, exists in said house. He also leaves with the family the State circular relating to the particular disease which has been reported, and form 38, relating to disinfectants and their use. Should the case be one of peculiar malignancy or noticeable from any other cause, the Board is kept informed of its progress by the inspector or physician, and precautionary measures taken accordingly.

“At the termination of the case the Board is informed what measures of disinfection have been taken, and in cases where parties have been unable to perform this duty, the Board has furnished materials and a proper person to do the work.

“No objection is made by householders to the affixing of the card. On the contrary, they express themselves glad to be relieved of the responsibility of giving notice of the disease.”

MARYLAND.—*Baltimore* reports for five weeks ending October 29th, 747 deaths in a population estimated at 437,155, of which 308 were under five years of age. Death-rate, 17.79 per 1000. From zymotic diseases there were 141 deaths, and from consumption, 94.

MASSACHUSETTS.—*Boston* reports for the month of October 838 deaths in a population estimated at 400,000, of which 286 were under five years of age, and representing an annual death-rate of 25.1 per 1000. From zymotic diseases there were 150 deaths, and from consumption, 127.

MICHIGAN.—The Secretary reports that for the month of October, 1887, compared with the preceding month, the re-

turns indicate that bronchitis, pneumonia, remittent-fever, scarlet-fever, diphtheria, and tonsillitis increased, and that diarrhœa, dysentery, cholera morbus, cholera infantum, and typhoid-fever decreased in prevalence. Compared with the preceding month, the temperature was considerably lower, the absolute humidity was much less, the relative humidity was less, the day and the night ozone were more.

Compared with the average for the month of October in the nine years, 1879-1887, intermittent-fever, consumption of lungs, diphtheria, and diarrhœa were less prevalent in October, 1887. Compared with the average of corresponding months for the nine years, 1879-1887, the temperature was considerably lower, the absolute humidity was less, the relative humidity was the same, the day ozone was slightly more, the night ozone was less.

Including reports by regular observers and others, diphtheria was reported present in Michigan during the month at fifty-eight places, scarlet-fever at thirty-six places, typhoid-fever at forty-five places, measles at twelve places, and small-pox at one place. Reports from all sources show diphtheria reported at seven places more, scarlet-fever at five places more, typhoid-fever at one place less, measles at seven places more, and small-pox at the same number of places in the month of October, 1886, as in the preceding month.

*Detroit* reports for the month of October 223 deaths in a population estimated at 200,000, of which 91 were under five years of age, and representing an annual death-rate of 13.12 per 1000. From zymotic diseases there were 82 deaths, and from consumption, 21.

MINNESOTA.—*St. Paul* reports for the month of October 148 deaths in a population estimated at 150,000, of which 63 were under five years of age, representing an annual death-rate of 11.84 per 1000. From zymotic diseases there were 55 deaths, and from consumption, 13.

MISSOURI.—*St. Louis* reports for the month of October 764 deaths in a population estimated at 420,000, of which 295 were under five years of age, and representing an annual death-rate of 21.83 per 1000. From zymotic diseases there were 262 deaths, and from consumption, 74.

NEW JERSEY.—*Hudson County* reports for the month of October 487 deaths in a population estimated at 258,000, of which 211 were under five years of age, and representing an annual death-rate of 22.5 per 1000. From zymotic diseases there were 86 deaths, and from consumption, 57.

*Newark* reports for the month of October 252 deaths in a population estimated at 165,967, of which 94 were under five years of age, and representing an annual death-rate of 18.32 per 1000. From zymotic diseases there were 53 deaths, and from consumption, 21.

*Paterson* reports for the month of October 135 deaths in a population estimated at 66,000, of which 65 were under five years of age, representing an annual death-rate of 24.54 per 1000. From zymotic diseases there were 30 deaths, and from consumption, 12.

NEW YORK.—The Secretary reports the total mortality of 125 towns of 3000 inhabitants and upward, comprising a population of about 3,500,000, for the month of October, 7370; the percentage of mortality, under five years, being 31.3. From zymotic diseases there were 1487 deaths, or 201.63 per 1000 total mortality. Of these 40.19 per 1000 total mortality were from diarrhoeal diseases; 24.38 from typhoid-fever; 96.04 from diphtheria. Diphtheria is reported from 39 towns not specified in the *Bulletin*, more than a single death occurring in Flatbush, Patterson, Warrensburg, Stratford, Whitestown, Sheldon, Greece, and Granby. Small-pox is reported from no new locality. From consumption the death ratio per 1000 is 127.65, and 186.54 per 1000 above the age of five years. The combined death ratio from consumption, zymotic and puerperal diseases is 336.51. The death-rate from acute respiratory diseases is 116.21. Of 125 reporting localities, the aggregate population of which is 3,710,500, the annual death-rate per 1000 population for the month is 19.82.

*New York City*, 1,481,920: Deaths, 2787, representing an annual death-rate of 23.76. Deaths under five years, 1012, 36.3 per cent of total from all causes. From zymotic diseases: Cerebro-spinal meningitis, 16; typhoid-fever, 38; malarial diseases, 33; small-pox, 2; scarlet-fever, 44; measles, 10; erysipelas, 7; whooping-cough, 8; croup and diphtheria,

228 ; diarrhœal diseases, 141 ; per 1000 deaths from all causes, 189. Consumption, 425 ; acute respiratory, 411 ; puerperal diseases, 19.

*Brooklyn*, 757,755 : Deaths, 1319 ; death-rate, 20.88 ; deaths under five years, 518—39.4 per cent of total. From zymotic diseases : Typhoid-fever, 28 ; malarial diseases, 30 ; scarlet fever, 29 ; erysipelas, 3 ; whooping-cough, 3 ; croup and diphtheria, 149 ; diarrhœal diseases, 49 ; 220.45 per 1000 deaths from all causes. Consumption, 152 ; acute respiratory diseases, 181 ; puerperal diseases, 9.

*Buffalo*, 202,818 (for four weeks ending October 29th) : Deaths, 346 ; death-rate, 22.18 ; deaths under five years, 149—43.1 per cent of total. From zymotic diseases : Cerebro-spinal meningitis, 3 ; typhoid-fever, 8 ; malarial diseases, 4 ; scarlet-fever, 7 ; measles, 4 ; whooping-cough, 1 ; croup and diphtheria, 57 ; diarrhœal diseases, 20 ; 300.00 per 1000 deaths from all causes. Consumption, 30 ; acute respiratory diseases, 33 ; puerperal diseases, 1.

*Rochester*, 110,000 : Deaths, 177 ; death-rate, 19.31 ; deaths under five years, 58 ; 32.2 per cent of total. Deaths from zymotic diseases : Typhoid-fever, 9 ; malarial disease, 1 ; scarlet-fever, 1 ; measles, 1 ; croup and diphtheria, 14 ; diarrhœal diseases, 4 ; 169.49 per 1000 deaths from all causes. Consumption, 25 ; acute respiratory diseases, 13 ; puerperal diseases, 1.

*Albany*, 96,000 : Deaths, 152 ; death-rate, 19 ; deaths under five years, 39 ; 25.8 per cent of total. Deaths from zymotic diseases : Typhoid-fever, 7 ; scarlet-fever, 3 ; croup and diphtheria, 13 ; diarrhœal diseases, 1 ; 157.85 per 1000 deaths from all causes. Consumption, 33 ; acute respiratory diseases, 12.

*Syracuse*, 78,000 : Deaths, 112 ; death-rate, 17.23 ; deaths under five years, 26 ; 23.2 per cent of total. Deaths from zymotic diseases : Typhoid-fever, 2 ; malarial diseases, 3 ; scarlet-fever, 1 ; croup and diphtheria, 7 ; diarrhœal diseases, 2 ; 112.92 per 1000 of total. Consumption, 10 ; acute respiratory diseases, 14 ; puerperal diseases, 2.

*Lowest Death-rates* : The five cities or towns of the State of 10,000 inhabitants and upward, having the lowest death-rates during the month of October, were Lockport (15,000), 7.20 ; Jamestown (14,000), 8.57 ; Middletown (10,000), 9.60 ; Hempstead (18,160), 10 ; Hudson (10,000), 10.80.



*Highest Death-rates* : The five cities or towns of the State of 10,000 inhabitants and upward, having the highest death-rates during the same month, were Long Island City (21,000), 27.43 ; Edgewater (10,000), 26.40 ; Saratoga Springs (10,000), 24 ; New York (1,481,920), 23.76 ; Buffalo, 22.18. The highest of any town or city reported was that of Hoosic Falls (6000), 40 deaths per 1000.

NORTH CAROLINA.—The November *Bulletin* gives a summary of the returns from fifty counties for the month of October, during which period there was no epidemic prevalent in the State. Typhoid-fever is reported in fifteen, but in four only—Guilford, Rowan, Rutherford, and Watauga—with any considerable prevalence. Diphtheria is reported in eight, and, in its usual relation with typhoid-fever as a filth disease, most prevalent in the same counties. The exemption from malarial fevers is remarkable for the season, a few cases in four or five counties only ; and pernicious fever in but one.

*Wilmington* : population—white, 9900 ; colored, 13,500—23,400. Death-rates : white, 11.1 ; colored, 17.3 : 14.1.

*Charlotte* : population—white, 6000 ; colored, 5000—11,000. Death-rates : white, 6.6 ; colored, 32.0 : 18.1.

*Asheville* : population—white, 4641 ; colored, 2607—7248. Death-rates : white, 17.2 ; colored, 26.8 : 20.7.

*Durham* : population—white, 4500 ; colored, 2500—7000. Death-rates : white, 15.5 ; colored, 16.0 : 13.7.

*Fayetteville* : population—white, 2500 ; colored, 1800—4300. Death-rates : white, 16.0 ; colored, 27.7 : 20.9.

*Raleigh* : population—white, 8000 ; colored, 7000—15,000. Death-rates : white, 22.5 ; colored, 22.8 : 22.0.

OHIO weekly health *Bulletin* for five weeks ending October 28th, reports cases of measles, 47 ; diphtheria, 127 ; scarlet-fever, 41 ; whooping-cough, 48 ; typhoid-fever, 120 ; typho-malarial-fever, 123 ; cholera infantum, 29 ; other diarrhœal diseases, 399.

A *Sanitary Convention* will be held under the auspices of the State Board of Health, in the city of Akron, O., on Wednesday and Thursday, January 25th and 26th, 1888. The object is to awaken an interest in sanitary matters, by bringing to-

gether those who are interested in personal and public hygiene, and who favor the diffusion of such information among the people as may secure exemption from preventable diseases. Local boards of health, school boards, medical, dental, and pharmaceutical societies, associations of architects and engineers, railroad and manufacturing corporations, are requested to be present by representatives.

The following subjects will be discussed : Sanitary Relation of Teachers to School Children ; Akron Churches and Sunday-school Rooms ; Disposal of Waste Products in Villages, Water-Supply, Sewers, and Disposal of Sewage in Akron ; Typhoid-fever a Preventable Disease ; School Sanitation ; Sources of Water-Supply for Towns ; Akron's Theatres and Halls ; Hygiene of Occupations ; Sanitary Condition of Summit County Infirmary ; The Luminous Brain from a Sanitary View ; Workshops and Factories of Akron ; The Agency of the Lower Animals in Producing and Propagating Diseases Affecting Man ; Practical Conclusions on the Prevention of Cholera ; Sanitary Management of Contagious and Infectious Diseases ; Origin and Propagation of Diphtheria, and Sanitary Condition of Dwellings and Premises of Akron.

*Committee of Arrangements.*—Dr. E. W. Howard, Chairman ; Dr. William Murdock Secretary ; Rev. T. E. Monroe, Joseph Hugill, David L. King.

For further information, address C. O. Probst, M.D., *Secretary State Board of Health*, Columbus, O.

*Cincinnati* reports for the month of October 446 deaths in a population estimated at 325,000, of which                      were under five years of age, representing an annual death-rate of 16.47 per 1000. From zymotic diseases there were 112 deaths, and from consumption, 69.

PENNSYLVANIA.—*Philadelphia* reports for five weeks ending October 29th, 1732 deaths in a population estimated at 993,801, of which 581 were under five years of age. Death-rate, 18.1 per 1000. From zymotic diseases there were 246 deaths, and from consumption, 236.

*Pittsburg* reports for five weeks ending October 25th, 380 deaths in a population estimated at 200,000, of which 141 were under five years of age. Death-rate, 19.0 per 1000. From

zymotic diseases there were 79 deaths, and from consumption, 43.

RHODE ISLAND.—*Providence* reports for the month of October 244 deaths in a population estimated at 121,500, of which 110 were under five years of age, and representing an annual death-rate of 24.10 per 1000. From zymotic diseases there were 91 deaths, and from consumption, 30.

TENNESSEE.—October has been a month of excellent health. Low waters have not caused as much trouble in Tennessee as in several other valley States.

The principal diseases in the State for the month of October, were as follows, named in the order of their greater prevalence: Malarial-fever, dysentery, consumption, pneumonia, croup, bronchitis, bilious-fever, rheumatism, and diarrhœa.

Typhoid-fever is reported in the counties of Carroll, Chester, Crockett, Cumberland, Davidson, Decatur, Franklin, Gibson, Hamilton, Hawkins, Haywood, Humphreys, Knox, Marshall, Maury, McMinn, Moore, Overton, Pickett, Putnam, Shelby, Stewart, Wayne, and Wilson.

Diphtheria in Bledsoe, Coffee, Davidson, Gibson, Hamilton, Hardeman, Knox, Marshall, Rutherford, Shelby, and Wilson.

Whooping-cough in Anderson, Bledsoe, Blount, Cumberland, Davidson, Hamilton, Humphreys, Knox, Montgomery, Overton, and Shelby.

Measles in Crockett, Gibson, Hamilton, Knox, Maury, McMinn, Pickett, and Wayne.

Scarlet-fever in Crockett, Davidson, Knox, McMinn, Rutherford, and Shelby.

Mumps were reported in Anderson, Moore, Pickett, Putnam, and Washington counties.

Roseola in Washington, Weakley, and Williamson.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows:

Chattanooga, white,	17.5	;	colored,	34.15	:	23.35
Clarksville,	"			14.40	;	" 28.00 : 19.50
Columbia,	"			20.06	;	" 19.36 : 19.76

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Knoxville, white,	9.38 ;	colored,	22.08 : 11.98
Memphis,	" 18.50 ;	"	38.50 : 25.60
Nashville,	" 12.61 ;	"	23.66 : 16.57
Tullahoma,	" 23.07 ;	"	.00 : 18.7

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The month was characterized by the large percentage of clear or fair weather, and the almost total absence of electrical disturbances. The other features showed but slight departures from the normal. The cold wave which passed over the State on the 5th, resulted in a light frost in the Eastern and Middle divisions. Altogether, the month was a delightful one.

The mean temperature was 55°.9, slightly below the normal October mean of the past five years. The maximum temperature observed was 90°, recorded on the 10th, and was the highest October maximum during the five years, except in 1884, when it reached 99°. The minimum temperature was 22°, recorded on the 31st, and was, together with the October minimum in 1884, the lowest in the above corresponding period. The monthly range of temperature was the greatest October range during the above period, except in 1884. There were three cold-wave predictions during the month—viz., 4th, 5th ; 24th, 25th, and 29th, 30th, all of which were fully verified.

The mean precipitation for the month was 2.57 inches, slightly below the normal of the past five years.

VIRGINIA.—*Richmond* reports for the month of October 165 deaths in a population estimated at 100,000, of which 58 were under five years of age, and representing an annual death-rate of 19.8 per 1000. From zymotic diseases there were 46 deaths, and from consumption, 14.

WISCONSIN.—*Milwaukee* reports for the month of October 231 deaths in a population estimated at 180,000, of which 76 were under five years of age, and representing an annual death-rate of 15.4 per 1000. From zymotic diseases there were 51 deaths, and from consumption, 21.

YELLOW-FEVER at Tampa, Fla., as reported by Supervising Surgeon-General Hamilton, of the Marine Hospital Service,



on returns up to November 30th, 1887, summed up a total of cases (approximately) from the beginning of the outbreak, 390, and of deaths, 72. December 5th: "Since 30th ultimo, 10 cases, 2 deaths. To-day, no new cases, 1 death." December 16th: "Hospital closed, but there are still a few cases of the disease in Tampa." December 30th: "A few scattering cases, mild in character, are reported as still remaining at Tampa, and, as the quarantine has been raised, refugees are returning."

Havana: During the month of November, the number of deaths from yellow-fever was 24. During the week ending December 17th, 2.

Santiago de Cuba: During the week ending November 26th, 10 cases and 9 deaths were reported in the military hospital; 2 deaths had occurred on board a Spanish man-of-war. During the week ending December 10th, 3 deaths and 2 cases in military hospital.

Cienfuegos: During the two weeks ending November 28th, 6 deaths.

CHOLERA reports as summed up from Surgeon-General Hamilton's Abstract of Consular Reports to the State Department, December 2d to 30th, and from other sources, as follows:

"Lima, Peru.—The United States *chargé d'affaires ad interim*, under date of December 3d, 1887, encloses a copy of a newspaper-clipping stating that 'a police medical officer lately commissioned by the supreme government to report the increase of cholera in Chili sent on the 29th ultimo the following cablegram to the foreign office: "Santiago, 70 cases; Talca, 1; Chillan, 16; Valparaiso, 6 sick in lazaretto, buried, 19."' Another clipping states that the Ministry, in consideration of the fact that cholera has made its appearance in Chilian ports, and that rigorous quarantine cannot yet be established on account of the lazaretto ordered to be constructed for said purpose not being finished, have ordered the ports closed to all shipping proceeding from the ports of the Chilian Republic, and those that may have touched in them, with the exception of Punta Arenas (Sandy Point).

"Malta.—The United States Consul, in his despatch dated

November 16th, 1887, states that 'this island has been declared free from cholera or other contagious disease, and the local government commenced yesterday issuing clean bills of health. The British bark, Brothers Apap, which called here from Alexandria, Egypt, with a cargo of rags, bound to New Haven, Conn., left for the latter port, without having communicated with this island, on the eve of the Government declaring Malta free from cholera. The quarantine restrictions hitherto maintained against arrivals from southern Italy and Sicily have been raised, vessels from any port being now admitted here to pratique.'

"Florence.—The United States Consul, in his cablegram dated December 2d, 1887, states that 'Agent Cagliari reports cholera at Terralba, Sardinia.' . . . In his despatch dated December 2d, 1887, confirms his telegram of the same date, as follows: 'Agent at Cagliari reports cholera at Terralba, Sardinia.' The consular agent further reports that 'on the part of the authorities the fact is kept as quiet as possible, but I have received reliable information that the news is, unfortunately, true.' A newspaper accompanying the above, published at Cagliari, dated November 28th, 1887, reports 13 cases and 12 deaths from cholera at Terralba from November 16th to 27th, inclusive."

Marseilles: The United States Consul reports the arrival on November 30th, of the British steamer Rohilla, on board of which a Lascar fireman had died of cholera four days before reaching Marseilles. The Rohilla was detained in the outer roadstead several hours by the Health Officer, but a thorough inspection made it apparent that every precaution had been taken on board, and the steamer was permitted to enter this port, complete her cargo, and clear for London.

Calcutta: During the three weeks ending November 5th, the number of deaths from cholera was 44.

Bombay: During the three weeks ending November 9th, the number of deaths from cholera was 17.

Madras: During the three weeks ending November 4th, the number of deaths from cholera was 129.

SMALL-POX.—Deaths registered from this disease during the periods stated as follows:

Havana : During the month of November, 239 ; during the three weeks ending December 17th, 209.

Cienfuegos : During the four weeks ending December 12th, 31.

Guayaquil : During the four weeks ending December 8th, 72.

Buenos Ayres : During the month of September, 103.

Rio de Janeiro : During the three weeks ending October 22d, 281.

Sheffield : During the three weeks ending December 17th, 59.

Bristol : During the three weeks ending December 17th, 4.

Paris : During the three weeks ending December 17th, 18.

Marseilles : During the month of November, 2.

Bordeaux : During the month of November, 4.

Lyons : During the three weeks ending December 10th, 3.

Nantes : During the month of November, 1.

Havre : During the week ending December 17th, 1.

Nice : During the three weeks ending November 30th, 15.

Brussels : During the week ending December 17th, 1.

Nivelles : During the week ending December 17th, 1.

Pesth : During the three weeks ending December 10th, 3.

Vienna : During the three weeks ending December 10th, 2.

Prague : During the three weeks ending December 10th, 49.

Triest : During the three weeks ending December 17th, 26.

Presburg : During the three weeks ending December 3d, 2.

Warsaw : During the three weeks ending December 10th, 34.

Rome : During the three weeks ending November 19th, 32.

Milan : During the month of August, 21.

Genoa : During the month of October, 44.

Florence : During the month of September, 59.

Catania : During the month of September, 1.

Saragossa : During the month of October, 25.

Lisbon : During the week ending October 22d, 8.

Padua : During the month of September, 1.

Bucharest : During the week ending December 17th, 1.

Cairo : During the week ending December 1st, 1.

Alexandria : During the week ending December 1st, 1.

## LITERARY NOTICES.

MEDICAL SOCIETY TRANSACTIONS: 1. *Transactions of the Medical Association of Texas*, 1886. 8vo, pp. 691. From the Secretary, F. E. Danniel, M.D., Austin.

2. *Transactions of the Medico-Chirurgical Faculty of Maryland*, 1886. 8vo, pp. 254. From the Corresponding Secretary, T. Barton Brune, M.D., Baltimore.

3. *Transactions of the State Medical Society of Wisconsin*, 1886. 8vo, pp. 254. From the Secretary, J. T. Reeve, M.D., Appleton.

4. *Proceedings of the Connecticut Medical Society*, 1886. 8vo, pp. 241. S. B. St. John, M.D., Secretary, Hartford.

These volumes are filled with matter for the most part of practical importance to medical practitioners throughout the country. But unfortunately, in conformity with a bad custom, instead of being contributed to medical periodicals, or at the least severally to some one medical periodical of large circulation (and with extra sheets for as many volumes as required), the contributions are, by this the usual process of publication, well-nigh wholly buried. They are mere archives for the members who have participated in the society proceedings, not even generally supplied to medical libraries.

With regard to *preventive medicine*, to which we shall limit our review, there is, we regret to say, an unusual sparseness. 1. Dr. R. P. Talley, of Belton, reports, as Chairman of the Section on Medical Jurisprudence, Chemistry, and Psychology, the necessity of legislative action for the prevention of fœticide, the careless use of anæsthetics, and the better care of the insane.

2. Professor George H. Rohé, M.D., of Baltimore, Chairman of the Section on Sanitary Science, contributes a paper on the "Sanatary and Sanatory Relations of Food," in which he reviews and endorses the essays of Sir Henry Thompson on overfeeding, discusses the teachings of Liebig, Voit, and others with regard to the essential elements and classification of foods, the different classes of food supplies, food prepara-



tions, etc., and their nutritive values ; and indulges in a hair-splitting distinction between the application of sanitary and sanitory practices in the treatment of corpulence. Dr. E. G. Waters contributes a paper to the same volume on "Sewerage and House Drainage," giving a condensed statement of the different systems of sewerage and of house drainage in vogue, and specially urges the importance of sewerage to the city of Baltimore.

3. Dr. E. L. Boothby, of Hammond, Wis., in a paper on "Leprosy" makes some very important suggestions on the possible danger of that disease spreading in the United States. He reviews other recent reports upon it, that cases have cropped out in Minnesota, South Carolina, Louisiana, Wisconsin, Iowa, Oregon, and California ; in Canada—New Brunswick and Cape Breton. Hence the question arises, "With new blood to feed upon, may it not, and considering its history will it not in all likelihood, if not interfered with, diffuse itself insidiously and universally throughout the nation, gaining vitality and strength as it progresses? Governmental interference should be urged. Congress should provide a central lazaretto, and every leper in the United States should be removed thither."

4. 'O Tempora ! O Mores !' is the caption of a by no means sensational but very grave article by Dr. John G. Stanton, of New London, Conn., on the privileges of the most dangerous class of wretches that pervade human society—quack doctors and others whose livelihood is foeticide, and upon whom, in Connecticut, there appears to be no legal restriction. An example of one is given whose "fame extended far and wide (*sub rosa*) as the friend of the unfortunate, both married and single," but who, when justice got on his track, estopped proceedings by a numerously signed petition of influential citizens ! Drs. H. E. Smith and William E. Lockwood, of New Haven, contribute a brief paper on the New Haven Water-Supply, seriously calling in question a previous report—that of Dr. Arthur J. Wolff, of Hartford—to the State Board of Health for 1885, exposing "what appears to be incompetence or carelessness" on the part of Dr. Wolff, by which the water was made to appear a good deal worse than it really was. Dr. Gustavus Eliot, of New Haven, contributes

a paper on the "Prevention of Insanity," attaching special importance to the early detection and appropriate treatment of defective nutrition of the nervous structures of the cerebrum, the predisposing\* effect of irritable nervous habits and actions, the use of irritant substances, and insomnia. He summarizes his conclusions as follows :

"In order to prevent the occurrence of insanity it is necessary, I., To avoid the transmission of a hereditary tendency thereto, by discouraging marriage between persons of like tendencies in this direction.

"II., In persons with a hereditary or acquired tendency in this direction, to counteract the tendency as far as possible,

"1. By insuring regularly an adequate amount of sleep and a sufficient quantity and variety of nutritious food.

"2. By securing recreation and relaxation.

"3. By maintaining the action of the secretory and excretory organs.

"4. By avoiding entirely the use of alcohol and other cerebral stimulants.

"5. By cultivating habits of self-control.

"6. By encouraging objectivity rather than subjectivity of thought, breadth, and not narrowness of mental activity.

"7. By avoiding anxiety and excessive mental exertion.

"8. By taking disappointments philosophically, forgetting them quickly, and not brooding over the unpleasant occurrences of the past, but anticipating with cheerfulness the events of the future."

THE PALLISER SPECIFICATION BLANKS, of which we have received a specimen copy from Palliser, Palliser & Co., New York, are of great practical utility to all builders and other persons engaged in designing buildings, as by the use of these blanks they will save much time and expense in writing out and having copied the necessary prerequisites. They are adapted to all kinds of structures, in different forms to suit the cost. The same firm also announces the publication at an early day of a comprehensive and complete work on plans and details. The Messrs. Palliser are well-known European architects, who came to this country some few years ago, and were the first to introduce this modern taste into our domestic architecture, striking at everything in the shape of ugliness, and putting forth instead sound and economical construction combined with good taste in design.

SOME IMPORTANT POINTS IN THE TREATMENT OF DEEP URETHRAL STRICTURE (read before the Medical Society of the State of New York, February, 1887). By F. N. OTIS, M.D., Clinical Professor of Genito-Urinary Diseases in the College of Physicians and Surgeons, New York. From the *New York Medical Journal*. A pamphlet of much practical utility to all medical practitioners.

INTUBATION OF THE LARYNX. By E. FLETCHER INGALS, M.D., of Chicago. From *New York Medical Journal*. A report of twelve cases, with three recoveries, by this new substitute for tracheotomy, with apparently better results. "Suppurative Inflammation of the Antrum" (from the Journal of the American Medical Association), by the same writer, is also a report of cases showing the results of good practice in a rather uncommon affection.

HOW CAN THE MORTALITY OF CONSUMPTION BE REDUCED? By JOHN J. BERRY, M.D., of Portsmouth, N. H. Pamphlet print of a paper read before the Sanitary Convention in Manchester, January 26th, 1887, pointing out the importance of fresh air, and a plenty of it, as the means above all others for the prevention of the most fatal of all diseases.

A REVIEW of the Most Important Advances in Surgery, Medicine, and Pharmacy in the Last Forty Years, by C. W. MOORE, M.D., of San Francisco. From *Pacific Record of Medicine and Surgery*. Good wheat, well sorted.

IMPORTANCE AND VALUE OF EXPERIMENTAL RESEARCH. DOCTORATE ADDRESS AT THE GRADUATING EXERCISES OF THE COLLEGE OF PHYSICIANS AND SURGEONS, CHICAGO, ILL., February 21st, 1887, by N. SENN, M.D., of Milwaukee, Professor of Principles and Practice of Surgery and Clinical Surgery. Reprint from *Western Medical Reporter*. A well-chosen subject admirably treated.

A DESCRIPTIVE NARRATIVE OF THE EARTHQUAKE OF CHARLESTON, August 31st, 1886. Prepared expressly for the

"City Year Book," 1886, by Mr. CARL MCKINLY, with Notes of Scientific Investigations, Map of the Epicentral Region, Meteorological Record, Illustrations, etc. Pamphlet, pp. 96. A concise compilation of what has been very generally described in the public prints.

CONDITIONS OF HEALTH IN CITIES, by J. L. KANE, Milwaukee, reprint from Wisconsin State Board of Health Report for 1886, is a pamphlet of twenty pages, which very clearly shows the benefits of practical sanitation by comparing the respective ratios of mortality in various places before and after its application, and the more clearly when, as in India, "sanitarians have been allowed full swing," where the death-rate has been reduced from 69 to 18 per 1000 in twenty years.

TRANSACTIONS OF THE TEXAS STATE MEDICAL ASSOCIATION, Nineteenth Annual Session, held at Austin, April 26th-29th, 1887. F. E. Daniel, M.D., Austin, Secretary. Pp. 433. The first hundred pages are taken up with the opening proceedings, minutes, and the Address of the President, Dr. T. H. Nott, of Goliad. This last is particularly devoted to the importance of pure medicines and the risks physicians run in patronizing druggists bent on making money at the sacrifice of human life. Next followed the reports of the chairmen of, and the contributions to the several sections into which the work of the Association is divided. Practice of Medicine, Obstetrics and Diseases of Children, Surgery and Anatomy, Ophthalmology and Otology, Electro-Therapeutics and Gynecology. *Preventive* medicine is ignored. The reports and papers in general are on subjects of practical importance, and, with few exceptions, promotive of practical knowledge. An address follows on "The University of Texas," by Thomas D. Wooten, M.D., President of the Board of Regents, giving a clear statement of the straitened circumstances and needs of the institution with relation to all the branches of education it contemplates, excepting those of agriculture and mechanics, which seem to possess a lion's share. Appended is the roll of members, constitution and by-laws of the Association, and the code of medical ethics.



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